SUPPLEMENT.

The Mining Journal,

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FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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Original Correspondence.

BLOWPIPE ANALYSIS FOR PRACTICAL MEN.

A very useful scheme for the qualitative determination of substances by the blowpipe has been arranged by Prof. T. Egleston, M.E., of Columbia College School of Mines, New York, and published in the *American Chemist*. He states that in the course of his instruction in blowpipe analysis he formerly found great difficulty in teaching the students how to distinguish with certainty the substances contained in a mixture of four or five ingredients, more particularly when the most of these were metals. The old routine method of examination on charcoal, then in the closed and open tube, &c., answered very well when not more than one or two metals were present, but did not seem to answer in the hands of beginners when they came to examine alloys of complex composition. For a long time he was convinced that it was quite useless to expect of a student that he should be able, without extended practice, to determine qualitatively the composition of a very complex substance. It finally suggested itself to him that a plan similar to the one used in certain quantitative assays would answer for the general outline of qualitative work. He, therefore, prepared a provisional scheme, which in order to test, he gave to students to work with. The result of this scheme convinced him that it was possible so to arrange one as to make it applicable to almost any compound, either natural or artificial, which would be met with in ordinary working. He therefore drew up a carefully prepared scheme which he modified from time to time as changes were suggested by its use in the Blowpipe Laboratory. The result was such, that after a few month's practice, he felt no hesitancy in giving to the students at their final examination mixtures containing 21 substances, one of which contained 12 different substances to be determined. This scheme, with some slight modifications, is the one which he is at present using. It has been in constant use for three years, and has effected an entire change in the working of the laboratory, the students finding great pleasure in what was before a subject of constant uncertainty. He has published it in the hope that it may help to make the use of the blowpipe in the determination of mixtures less difficult than it appears to be when it is approached without some such guide. He acknowledges in the preparation of the scheme the valuable suggestions of his two assistants, Mr. J. H. Caswell, and H. B. Cornwall, M.E.

The substance may contain—

As.	Se	Cu	Pb	Au	Cd	Br	SiO^3
Sb.	Fe	Co	Bi	Hg	Sn	I	NO^5
S.	Mn	Ni	Ag	Zn	Cl	CO^3	HO, &c.

1. Treat on *charcoal* in the *oxydising flame* to find volatile substances, such as arsenic, antimony, sulphur, selenium, lead, bismuth, silver, zinc, cadmium, &c. (p. 66, *et seq.*)

a.—If there be volatile substances present, form a coating and test it with microcosmic salt and tin on *charcoal* for antimony (p. 99), or to distinguish between lead and bismuth (p. 280).

b.—If there be no volatile substances present, divide a part of the substance into three portions and proceed as in A.

a.—Yellow coat, yielding with microcosmic salt a black bead, disappearing with blue flame, no part of it yielding green Sb. flame, indicates—Pb. and Bi.

b.—Yellow coat, generally with white border, yielding black or grey bead with microcosmic salt disappearing with blue flame; also the border disappearing with green flame indicates—Pb. and Sb.

c.—Yellow coat, very similar to *b*, but yielding no blue flame, indicates—Bi. and Sb.

2.—If ARSENIC, ANTIMONY, SULPHUR, or SELENIUM be present, roast a large quantity thoroughly on *charcoal* (p. 77). Divide the substance into three portions and proceed as in A.

A.—Treatment of the First Portion.

Dissolve a very small quantity in *borax* on *platinum wire* in the ordinary flame and observe the colour produced. Various colours will be formed by the combination of the oxides. Saturate the bead and shake it off into the porcelain dish; repeat this once or twice (p. 79).

a.—Treat these beads on *charcoal* with a small piece of lead, silver, or gold, in a strong reducing flame (p. 113).

b.—IRON, MANGANESE, COBALT, &c., remain in the bead (p. 115).

If the bead spread out on the charcoal, it must be collected to a globule by continued blowing.

Make a borax bead on platinum wire and dissolve in it *some* of the fragments of the bead, reserving the rest for accidents.

c.—NICKEL, COPPER, SILVER, GOLD, TIN, LEAD, and BISMUTH are reduced and collected by the lead button (p. 115).

Remove the lead button from the bead while hot, or by breaking the latter, when cold, on the anvil between paper, carefully preserving all the fragments.

d.—If COBALT be present the bead will be blue.

If a large amount of IRON be present add a little borax to prove the presence or absence of COBALT (p. 222).

If MANGANESE be present the bead when treated on platinum wire in the oxidising flame will become dark violet or black.

e.—If *no* COBALT be present the bead will be almost colourless.

Look here for Cr, Ti, Mo, U, W, V, and Ta.

f.—Treat the button *c* on *charcoal* in the oxidising flame until all the lead, &c., is driven off; NICKEL, COPPER, SILVER, GOLD remaining behind, or separate the lead with boracic acid (p. 442).

g.—Treat the residue *g* on *charcoal* in oxidising flame with microcosmic salt bead, removing the button while the bead is hot.

h.—If NICKEL and COPPER be present the bead will be green when cold (p. 292). If NICKEL only—yellow. If COPPER only—blue. Prove COPPER by treating with tin on charcoal in the reducing flame (p. 293).

i.—For SILVER and GOLD make the special test No. 8.

B.—Treatment of the Second Portion.

Drive off the volatile substances in the oxidising flame on charcoal. Treat with the reducing flame, or mix with soda, and then treat with the reducing flame for ZINC, CADMIUM, and TIN. If a white coating be formed test with *cobalt solution* (pp. 251, 256, 276).

C.—Treatment of the Third Portion.

Dissolve some of the substance in microcosmic salt on platinum wire in the oxidising flame, observing whether Si O^2 be present or not, and test for MANGANESE with nitrate of potassa (p. 210).)

2.—Test for ARSENIC with soda on charcoal in the reducing flame, or with *dry* soda in a closed tube (p. 345, *et seq.*) 4.—Dissolve in microcosmic salt on platinum wire in the oxidising flame (if the substance be not and do not contain any *sulphur*) and test for ANTIMONY on charcoal with tin in the reducing flame (p. 99). 5.—Test for SELENIUM on charcoal (p. 368). 6.—In absence of *selenium* fuse with soda in the reducing flame, and test for SULPHUR on silver foil (p. 365). In presence of *selenium* test for SULPHUR in open tube (p. 366). 7.—Test for MERCURY with *dry* soda in a closed tube (p. 304).

8.—Mix some of the substance with assay lead and borax glass and fuse on *charcoal* in the reducing flame (p. 401). Cupel the lead button for SILVER (p. 407). Test with nitric acid for GOLD (p. 320).

9. Test for CHLORINE, BROMINE, and IODINE, with a bead of microcosmic salt saturated with oxide of copper. 10.—Test for Cl. or Br with bisulphate of potassa (p. 374). 11.—Test for HO in a closed tube (p. 353). 12.—Test on platinum wire or in platinum pointed forceps for *colouration of the flame* (p. 72, *et seq.*). 13.—Test for CO^2 with hydrochloric acid (p. 360). 14.—Test for NO^5 with bisulphate of potassa (p. 354). 15.—Test for TELLURIUM in an open tube (p. 351).

The numbers refer in all cases to Prof. Cornwall's translation of the last German edition of Plattner's work noticed in the *Mining Journal* a few weeks since. In the above the metals to be sought for are printed in SMALL CAPITALS, the heavier and dotted letters being inconvenient for use in a newspaper.

THE GREAT BLOCHAIRN IRONWORKS IN SCOTLAND.

Having finished our business in the great hives of industry on the banks of the Clyde, we resolved to visit these great ironworks, which, from their extent and the celebrity of the iron they produce, have become one of the distinguishing industrial monuments of Scotch capital and enterprise. The works are situated about 2½ miles from Glasgow, and the simplest and most easy mode of approach is to obtain a seat in a Hansome cab, which soon brings us into the smoky region of this famous establishment. We were at once introduced by one of the principals to Mr. Burt, the manager of the works, who kindly took us through the mills and forges, answered every question, and gave full information without the slightest reserve, explaining minutely the Siemens process, adopted here in heating all the ball and heating furnaces. This we considered of great importance, the more so because this is decidedly the largest iron manufactory in Scotland, and the quality of the iron produced is very superior, indeed, the fame of the Blochairn plates and angles in the London market had increased our desire to witness the manipulations in practice here which turned out such favourable results in plates and angles for the shipbuilders on the Clyde and elsewhere.

The works were well planned *ab initio*, covered by large and substantial roofing, sustained by plain iron columns, well adapted for the ingress of currents of air in the summer, and by no means likely to suffer from cold winds and rain in the winter. There are 3500 men employed here. There are 53 steam-engines, of different sizes; 120 puddling furnaces; 41 ball and heating furnaces; 9 steam-hammers, some falling with a force of 300 tons, no old-fashioned helves are used here; extensive and perfect ovens for generating Siemens' gas; 4 large plate-mills, with reversing gear, the machine power for the reversals being hydraulic, which is handled by a boy for each mill; each screw in the housings of the plate mills has likewise a boy attendant. There are also 3 merchant mills for angles and bars; these will turn out angles of any size and length required, used now in ship building. The works turn out from 1300 to 1500 tons of finished iron per week when in full work, and consume 3500 tons of coal and dross. When in steady work the annual produce of iron is about 60,000 tons, which at the present price of (say) 12*l.* per ton, reaches the enormous sum of 720,000*l.* Out of this sum a very large proportion is paid in wages and spent in Glasgow. The steam for the engines is generated under an economical system. The engines work some high pressure and others condensing, being well served with water by a canal, which supplies at the least two angles of the ground on which the works stand. The reversing gear of the mills works marvellously well, and the heating process is perfection itself. The large piles were brought out at the proper heat, uniform all through; and when it is remembered that the flame of the gas can be carried by the three conducting dampers to any part of the furnace, it is evident that Siemens's process is capable of heating large masses of iron without burning one part before the other part has absorbed the proper amount of caloric necessary for the whole.

We refrain from any further description of Siemens's process; suffice it to say the gas is generated from coal at some distance, and brought in a flue, or other conductor, to the heating furnace, and there, by the admixture of well understood equivalents of oxygen, regulated by the three dampers above referred to, the most perfect combustion is obtained, and the consequent amount of caloric evolved. Of course, the heating furnaces have, in addition, the usual damper at the top of the stack. We were highly gratified with the simple and easy method adopted to move these large piles from the furnace to the rolls: 2000 to 2500 lbs. weight in one pile were taken out with ease and promptitude, constantly dropped on to the trolley, and thrown into the grip of the rolls in less time than it takes us to write it. The rolls took them through and brought them back so quickly that they were immediately handed over to the hard rolls, which as quickly rolled them into splendid plates, and the operation of the rolling under the manipulations of this reversing action was so prompt and regular that the plate was turned out perfect and sound at one heat, with that light-blue colour so characteristic of the best plates made at Bloomfield, in South Staffordshire.

The machinery all through the works was true and in good order, with very little back-lash or noise. We observed that the pinions of the plate mills had rims, with nuts of copper and tin, and were told they succeeded well. Certainly they worked very smoothly, and upon enquiry we found were rarely subject to accidents. All the rolls used here are obtained from Claridge and North's famous foundry at Millfields, or other eminent Staffordshire makers; but the firm have extensive fitting shops, with lathes, planing machines, drilling machines, &c., where both soft and chilled rolls are turned. This is a good idea, and may be practised with profit by other ironmasters. Much delay often occurs, we all know, in getting the rolls turned. There is a large foundry here, capable of turning out the largest castings required in the works. Duplicates are always kept ready on the ground. We observed on the pig banks a choice selection of the raw material. Besides the best Scotch brands, a large quantity of the Barrow hematite, from the old works of the proprietors at Barrow, is used, and no doubt the high position the Blochairn brand of iron occupies in the market is mainly owing to the careful selection of the pig-iron used, the quality of the coal, and the able management which evidently directs the whole. These large works were purchased by Mr. Robert Hannay, the well-known ironmaster, who with Mr. Schnieder established, and still is one of the principal partners in, the great Barrow Steelworks. The Blochairn concern is being carried on by Hannay and Sons, the management at the works being in the charge of Mr. Thomas Hannay. We were informed on good authority that they have orders on hand to keep the works going for four months ahead, notwithstanding the present depressed state of the trade. The quantity of plate and angles produced would be the proper quantity required in building a ship of any size as the work progressed.

Whether we view these works in regard to the quantity of iron produced, or the quality when made, their extent or mode of manufacture, we consider them second to none that we have seen in the United Kingdom, and they bid fair to keep abreast with the great steelworks at Barrow, which in its development and progress has far outstripped and left behind other kindred concerns; and it should not be forgotten that the proprietors of the Blochairn, in connection with Mr. Schnieder, originated the great Barrow Works, which, by their great success in every respect, have rivalled all establishments of the same kind in this or any other country. SAM. GRIFFITHS.

133, *Cannon-street, London.*

THE AMALGAMATION PROCESS—ITS ADAPTATION TO BRITISH ORES.

BY PROFESSOR T. AYNESWORTH.

It has been with me a study of years as to whether or not a process of amalgamation could not be introduced into this country with a view to the cheap extraction of the metals, both base and precious. I have found that in most copper, and in all lead, zinc, and mundic courses, that a certain quantity of silver is found in combination with the minerals and matrices forming the lodes; but it is so small a portion that hitherto it has been thought waste of time and money to attempt the extraction of the silver contained therein. The performance of this has been my study, and it seems to me to be very far from impossible. Divers methods have been proposed, and in some cases adopted; but never, I believe, in England (with the proposed exception, as mentioned hereafter), and even abroad ores containing less than 30 ozs. have been thrown aside as waste. Whereas in this country the finding of silver ore is rather a rare occurrence, the principal part of the silver being procured from silver-lead ores, which on an average give 50 ozs. to the ton, therefore the process to be adopted here ought to combine cheapness with quickness of operation, for the average results made by me from different samples taken from divers old waste heaps in Cornwall and Devon, containing copper, tin, lead, zinc, antimony, mundic, and other mineralised substances, mixed indiscrimately, gave 8 ozs. 5 dwts. per ton, and other picked samples gave from 10 to 30 ozs. In one row of burrows refuse from the workings of formerly rich mines gave from my own picking—mundic, 22 ozs.; blende, 27 ozs.; and lead, 28 ozs.; and, considering these heaps have been worked over since the mines began working for lead, I thought the produce very good. Having settled the question as to the silver really existing in the stuff, the next and principal enquiry is can it be extracted, and, if so, at a profit? The Germans roast the ores with 10 per cent. of common salt, forming chlorides of whatever metals are contained in the ores, then extracting the silver by revolving in barrels with mercury and scrap iron—the latter attracting the chlorine, and leaving the silver in a finely-divided metallic state, which is taken up by the mercury, forming an amalgam, which is placed into bags of ticking or leather, and squeezed when the superbundance of quicksilver trickles through. The amalgam is then distilled in iron retorts, the mercury passes over in a state of vapour, and is condensed in the receiver, and is used over again. The Germans make this process pay very well; and I cannot see but the same might be applied to the poor ores of this country—it is to be done, for I visited a works about 10 miles from Plymouth, on the River Tamar, where barrels are already erected with stamps and furnaces, at which it is proposed to pass the ore through a course of treatment that I consider deserving of attention. The ores average 9 ozs. of silver per ton, which is combined with mundic, copper, lead, and earthy matter, are first stamped, then passed into a common round buddle, which reduces the quantity, at the same time enriching the quality, of the ore; for supposing 20 tons are stamped only about half that quantity is put into the furnaces, but the 10 tons contain as much as the whole of the 20 tons, for the reason that the lead, blende, copper, and mundic of their own specific gravity keep to the head of the buddle, allowing the light or waste to wash to the tail; this latter, if rich enough, is buddled a second time. The ore is next mixed with a little salt (smaller by quite 5 per cent. than is generally used for the reason given below), and chloridised in the furnaces for 18 hours, after which, and when cold, water is passed through the ore; this washes out the copper (which undergoes precipitation by iron by itself), then hot water for the washing out of the base metals still remaining, which precipitate of their own accord on the liquor growing cold.

The next processes are the revolution in the barrels with mercury and iron, which occupy half-a-day more, and the extraction of the amalgam and followiug processes, as described before. I ought to have mentioned that the river water (containing about 5 per cent. of salt) is raised and passed through the stamps; this, as a consequence, saturates the ore with salt water, which crystallises into salt in the furnace, saving, therefore, that quantity in the chlorodisation. The machinery on the works is on a very limited scale, but I understood the proprietors proposed forming a company to work the same in a more extensive manner, as they intend to have 25 heads of stamps, with plant to match; this will keep the barrels already erected at work day and night. The proprietors have put up four stamps, with an engine to work them, with four barrels and another engine, besides which on the works are two large engines, rather out of repair at present, but will cost very little to put to rights. I was much pleased with the appearance of the works, which were erected (I believe) for lead smelting, and have about a dozen furnaces (likewise out of repair), and other buildings of great use to such a place, as smiths' shop, assay office, with desilverising, open, and muffle furnaces complete, also a quay of its own within a few yards, which will be a great thing in the cheap conveyance of minerals, &c., and I understood the process had been employed with very great success on a small scale. The proprietors of this concern have com-

puted 100,000 tons of mineralised matter (which I looked over and took samples, which on mixing together and pulverising gave 9 ozs. 1 dwt. per ton, the separate samples gave, as before stated, respectively 22, 27, and 28 ozs.) on hand, and being anxious to work the process on a large scale, deserve encouragement in the successful launching of a company.

I will take an early opportunity of going into this subject more fully, giving a short account of the different processes that have been before the world, with their success or otherwise.

IRON SHIPBUILDING IN ENGLAND.

MR. JOHN CLARE'S INVENTIONS.

From their first introduction the patented inventions of Mr. John Clare, in connection with iron shipbuilding, have been prominently referred to in the *Mining Journal*, and the energy and ability displayed by him in establishing his claim to be "the original inventor, patentee, designer, promoter, and upholder of England's iron ships for national defence afloat," cannot but be admired. During the last 20 years Mr. Clare has struggled hard for life-preserving ships of iron, and this is a question of paramount importance not only to the iron interests of the United Kingdom in the expansive use of metal in lieu of timber for shipbuilding, but also for the protection of our trade and commerce throughout the world; it may be hoped, therefore, that every member of Parliament and other person interested in our great mineral staple should give the following memorial their serious consideration and substantial support. Mr. Clare has certainly done all that could reasonably be expected of him to establish his claim of being a man of origmal idea and master mind, possessed with indomitable courage and unrivalled perseverance, and the character of his designs may be accepted as evidence for ascertaining his right to be regarded as a great public benefactor, and an original inventor carrying out sound mechanical principles upon natural laws, and as one entitled to all that the British Nation can do to secure him right, truth, and justice, in the shape of a fair reward for his labour:—

To the Right Hon. G. J. GOSCHEN, First Lord Commissioner, State Department, Admiralty.

Memorial on behalf of JOHN CLARE, of Liverpool and London, Naval and Mechanical Constructor in Metal Shipbuilding, the inventor, patentee, designer, promoter, and upholder of England's iron shot and fire-proof ships, on life preserving principles, for national defence afloat—*vide* Records at Admiralty, Board of Trade, Treasury, and War Office, since 1853.

Sheweth,—That the said John Clare is the inventor and patentee, by Her Most Gracious Majesty's Royal Letters Patent, dated Sept. 5, 1853, of certain improvements in iron shipbuilding, and among others (as appears by the specification of the said patent) of a longitudinal and vertical iron framework for vessels; such framework being independent of the plates or skin, and presenting, both longitudinally and vertically, a smooth flush surface, on which the plates are subsequently riveted. The entire frame being made of T-iron, both longitudinally and vertically, possesses sufficient strength in itself, though covered only with light plates, to enable a vessel of large tonnage to carry a heavy cargo without straining, and to resist the effects of heavy weather to an astonishing extent. In the construction of vessels according to the said invention the first thickness of planking is of teak, which, from the oleaginous nature of that description of timber will preserve the iron from oxidation; this bolted downwards through the flanges, also through the vertical framing, becomes one solid mass, and the frame not having joints like a timber-built ship must unquestionably give great stability; then a layer of cork put on the teak, and diagonal planking or sheathing over that, secured with wood screws or nails, and in some places bolted right through to the longitudinal framing; then alayer of cork again, and longitudinal planking secured through vertical framing with copper bolts, or screwed to the inner planking of teak. The joints all through may be caulked or not, and felt placed on the outside of the planking coppered. The thickness of planking, cork, &c., and the numbers of layers of cork, must be regulated according to the amount of power of resistance to shot required. The inside may be either ceiled with timber or diagonally laid with T-iron, the flanges of the plates at the joints may be riveted together longitudinally, and the sides riveted through the vertical framing, or a longitudinal and vertical frame of T-iron, the plates jump-jointed with the flanges on the outside of the plates for the timber, &c., &c.

There are various methods of carrying ont this principle of shipbuilding; but the said John Clare claims to be the originator and inventor of this method of iron shipbuilding, and alleges that the same method has been used and adopted in the building of certain vessels by the Admiralty for Her Majesty, subsequently to the date of the patent granted to your petitioner—in the construction of the vessels Warrior, Black Prince, Resistance, and others since 1859, six years after the date of the letters patent granted to the said John Clare.

It will be observed where machinery can be brought into play for setting the plates to any curve or angle, or in manufacturing such plates with tapers or flanges, rolls will be used, which have heretofore been looked upon as impracticable, but the result will enable any competent person to vouch for their efficiency, and that the principle is sound, though in conflict with and controverting the opinions of iron manufacturers, engineers, and others of experience. The principle, when carried out in all its bearings in ships of war, must produce a great accession of strength, with an increased buoyancy, and a more effectual resistance to shot.

2.—Shortly after the said John Clare had obtained the said letters patent of Sept. 5, 1853, he brought the same under the notice of the Lords Commissioners of the Admiralty, fully detailing the principle of the said invention, and particularly of the longitudinal and vertical framing, and the said John Clare also forwarded to the Admiralty certain models showing the description of longitudinal framing for iron ships, between which framing the timber is placed.

3.—In 1855 a correspondence ensued between the said John Clare and the then Secretary of the Admiralty (Thomas Phinn), and the said John Clare forwarded certain plans, drawings, and tracings of his said invention to the Admiralty.

About the end of October, 1856, the said John Clare furnished the Admiralty with a drawing for longitudinal and vertical H iron framing manufactured as a lattice girder, of which the framing proper of the Warrior and other subsequent iron ships built for the Royal Navy are exact copies, the original model and drawing of which is still in the said John Clare's possession. In the latter part of the year 1856 the said John Clare caused to be manufactured a piece of iron frame work, representing a girder of combined longitudinal and vertical iron framing for vessels, as patented by the said John Clare; the said piece of framing was afterwards, in or about the month of November, 1857, sent by the said John Clare to the office of Sir Baldwin Walker, the Surveyor of the Navy, at Whitehall, where it remained until the month of April, 1858.

4.—While the said models and plans were at the Admiralty, the said John Clare had many interviews with Sir Baldwin Walker upon the subject of the same, and a meeting was appointed by the said Sir B. Walker between himself, Mr. Isaac Watts, Mr. Thomas Lloyd, and the said John Clare, when the said model before referred to, and the principles of its construction, was examined and discussed, and the said Isaac Watts stated that in his opinion it was the proper principle on which ships ought to be built for the Royal Navy.

5.—In 1858 the said John Clare had several interviews at the Admiralty with the Secretary and others on the subject of shipbuilding, according to the principles disclosed in the patent of the said John Clare.

6.—Applications were subsequently made from time to time by the said John Clare to the Duke of Somerset, Lord Clarence Paget, Sir Baldwin Walker, and other members of the Admiralty Board and Executive Officers, upon the said John Clare ascertaining that vessels were being constructed for the Government upon the principles, plans, and models designed and invented by the said John Clare, the subject of his patent, and particularly in the construction of the vessels the Warrior, Black Prince, Defence, Resistance, and others, which were being built with a longitudinal and vertical framing of iron, independent of the plates, as shown in the model and plans sent to the Admiralty in 1857; the said John Clare thereupon applied for payment of commission which he considered was at that time due to him as a naval architect, in respect of some of the vessels before named, as such method of framing was one of the main elements in the patent of 1853.

7.—The said John Clare, failing to obtain any compensation, was at length compelled to resort to a petition of right to the Queen to enforce what he believed to be his just claim, setting forth the particulars of his said invention, and the facts as to its adoption by constructing and building in imitation of the said invention certain other iron ships or vessels with the vertical and longitudinal framing, and with iron plates fastened to each other, and to a frame work, as particularly specified, described, and claimed in the specification of the said John Clare.

8.—The said petition was opposed by the Attorney-General on the part of the Crown, who pleaded (among other pleas to the same) that the said Commissioners had not infringed the patent rights of the said John Clare, that the said John Clare was not the first and true inventor of the said invention, that the said invention was not new, and that the manufacture was not any manner of new manufacture.

9.—The said petition was heard in the Court of Queen's Bench, at Westminster Hall, on Monday, Feb. 2, 1863, and four following days, and it became and was material and important on the part of the Crown to show, in support of the pleas, that the said system of framing, as hereinbefore described by the said John Clare as a longitudinal and vertical framing of iron, independent of the plates, was not novel, and that vessels had been so constructed before the date of the patent granted to the said John Clare in 1853, and several eminent witnesses were called and examined upon this particular point, including, among others, Sir Charles Fox and John Scott Russell. The result or the said petition of right was a verdict for the Crown. The evidence of the said two witnesses, hereinafter more particularly referred to, was commented upon by the Lord Chief Justice as being of the greatest importance.

10.—The said John Clare, his counsel, and solicitors were taken completely by surprise by the said evidence. The said Sir Charles Fox deposed that there was no novelty in the said invention, because of a particular vessel which he alleged he had himself built upon the principle claimed by the said John Clare as his said invention, he stated that the first iron ship he had anything to do with was built by Messrs. Laird, at Birkenhead, in the years 1831 and 1832; that he was engaged by Messrs. Laird at that time, was their servant, and daily superintended the construction of the ship, and eventually put the engines on board; that the vessel was named the Alburka; that such ship had a wrought-iron keel, to which the ribs of angle irons were attached, and that such angle irons were connected at the top by means of a longitudinal stringer or angle iron; that such ship had at least three stringers—the keel and the two gunwale stringers at the top of the ribs, and that such stringers were put into the ship before the plates were put on; that in building the ship a framework was formed by means of the keel and two stringers, being connected with the ribs before the plates were put on, and that such framework was of itself a firm structure, consisting of longitudinal and vertical bars, independent of the plates.

11.—In the course of subsequent proceedings instituted by the said John Clare, one Andrew Morrison swore that he had himself designed, laid down, constructed, and finished the said vessel called the Alburka, in Messrs. Fawcett and Preston's Boiler Yard, Oil-street, Liverpool, that the said Sir C. Fox had nothing whatever to do with the construction of the said vessel. That the said vessel had not a wrought-iron keel, or any keel whatever, at the time she was built, but that afterwards he the said A. Morrison had himself adopted and constructed a wooden keel to the said vessel; that the said framework of the Alburka was not a firm structure of itself, but that the same was fastened and held together by the plates put on it, and that the said vessel the Alburka did not contain any stringers at all, or any keel; that there was but one longitudinal gunwale iron at the top of the ribs which did not act as a stringer, that there were not three, or any, stringers put into the said vessel the Alburka either before or after the plates were on; he also swore that Sir C. Fox was not in Messrs. Laird's employment when the Alburka was built, but that he was employed by Messrs. Braithwaite and Ericsson to put the engines on board the said vessel. And the said evidence of the said Andrew Morrison was confirmed by the information upon oath of his son John Morrison, who was on board the said vessel at the time that his father the said Andrew Morrison was superintending the building of the same, and the said John Morrison also deposed to the method of her construction.

12.—The said John Scott Russell deposed, on the hearing of the said petition, that Her Majesty's ship Warrior was built with vertical and longitudinal framing directly in contact with the skin of the ship, and that the longitudinals were built continuously from end to end, and that openings were made in the vertical frame to allow them to pass through; that a vessel called Her Majesty, built by him in 1850 or 1851, was built upon the same principle as the Warrior, that the said vessel called Her Majesty was built in 1850 or 1851, and that the method of uniting a system of longitudinals end to end with vertical framing running end to end was adopted in building such vessel the same as in building the Warrior; that the mode of construction adopted in the vessels Warrior, and Her Majesty, was identical; that the said vessel called Her Majesty was built with a framework formed of longitudinal and vertical bars, independent of the plates. That he had built five or six vessels only upon the said principle; he the said J. Scott Russell further deposed that the change which had taken place and was shown in the Warrior was that the longitudinals were directly in contact with the skin of the ship; that they were built continuously from end to end, and that openings were made in the vertical frame to allow them to pass through without injury, and he produced a drawing of a particular vessel built by him before 1853, in which he said the same method of uniting a system of longitudinals end to end with vertical framing running from end to end, as adopted in the Warrior, was used, that the said drawing was a drawing of a well-known mail boat called Her Majesty, which was placed on the line between Portsmouth and Ryde, in the year 1850 or 1851, and was then running; that the said vessel, which was but a small vessel, the longitudinal framing intersected the vertical, and that there were five vertical and six longitudinal frames.

13.—Upon enquiry it was ascertained that this statement was incorrect. The said vessel, Her Majesty, referred to by the said J. Scott Russell, was a vertical angle-iron framed vessel in which there were no transverse or vertical frames with the longitudinals going through them, that there were no longitudinals whatever in the said vessel intersecting or interpolating the verticals, and that there was but one stringer to the said vessel, which was not directly in contact with the skin of the ship, and which had been put into the said vessel five years after the vessel was built. Further, the said vessel, Her Majesty, was not built substantially upon a principle the same as the Warrior, and no mechanical comparison could be made between such two vessels; the framing of the vessel Her Majesty depended upon the plates when attached by the rivets, whereas the framing of the Warrior was quite independent of the plates.

14.—In confirmation of the foregoing, George Frederick Goble, a consulting engineer and master mariner, deposed that he had examined, shortly before the date of the said information, both the said vessels, Her Majesty and the Warrior, and that no mechanical comparison could be made between them; for that in the Warrior the longitudinals and verticals intersected each other in combination, and the framework was independent of the plates, whereas there was no intersection whatever in the vessel Her Majesty, which was dependent upon the plates; the stringer referred to had been added to the said vessel Her Majesty five years after she was built, and that there were in the stoke-hole, engine-room, and partly under the boiler two longitudinal sleepers on each side of the keelson, about 25 feet in length, apparently for the purpose of supporting the boiler and engine, and that there was no longitudinal framing in any part of the said vessel intersecting the vertical.

15.—The said information was further strengthened by the evidence of Mr. John Morrison, a shipwright of very considerable experience, who deposed that he had himself draughted, laid down, and constructed upwards of 100 iron steam ships and vessels, and that he had examined both the said vessels Her Majesty and the Warrior; that the vessel Her Majesty was a vessel constructed with a vertical angle iron frame, entirely dependent on the plates; that the vertical framing in the turns of the bilges in the space occupied by the boiler and engine-room were stopped by two longitudinal sleepers or bearers on each side of the keelson, about 25 feet in length, formed of a plate and angle irons; and the said John Morrison deposed that had the said vertical framing extended to the keelson, and the said two longitudinal sleepers or bearers crossed them as they should have done, it would have been impossible to get the boilers into the vessel; and, further, that in no part of the said vessel was there a combination of longitudinal and vertical framing, as the only longitudinals were those he had referred to amidships, which were not intersected by the verticals, and the vessel Her Majesty was, in fact, constructed with a vertical angle iron frame supported by the plates when attached by the rivets, whereas the said vessel, the Warrior, was constructed of longitudinal and vertical framing intersecting and interpolating, combined and rivetted together, and was a framework entirely independent of the plates, and that there was no mechanical resemblance in either principle or construction between the two vessels, the Warrior and Her Majesty.

16.—The said John Clare, upon the foregoing facts, took proceedings for perjury, but was advised to abstain from the prosecution of the same. The evidence obtained by him in support of that prosecution shows the verdict of the jury in the said petition of right to have been founded on misconception.

17.—Although the verdict was given in favour of the Crown, on the trial of the Petition of Right, such verdict was given in consequence of the evidence given by Sir Charles Fox and Mr. Scott Russell, which, as hereinbefore stated, was wholly untrue, but which evidence, even if true, was wholly beside the merits of the said John Clare, according to whose invention Her Majesty's ships have been recently constructed.

18.—Your memorialists respectfully submit that in the construction of Her Majesty's vessels of war since the date of the patent of the said John Clare, the country has benefited largely by the said John Clare's invention, and that the merits of the said John Clare have not been properly regarded. Your memorialists further suggest that the matters hereinbefore disclosed should be fully enquired into, and that compensation or remuneration should be made to the said John Clare, such as he may be fairly entitled to for the benefit and advantage which have accrued to the public service by reason of his said invention, as described and disclosed in the specifications of the patents hereinbefore referred to, and of the information furnished to the Admiralty, and of the very heavy expense the said John Clare was put to in respect of the premises, and in and about the instituting and prosecuting the Petition of Right, defeated under the circumstances hereinbefore stated, by evidence on the part of the Crown, given under mistake and misapprehension of the facts.

19.—Whatever may have been the strict legal rights of the said John Clare under his said patents, your memorialists conceive that he hae contributed most materially to the present system of construction of vessels of war, and that he is fairly entitled to some compensation or remuneration in respect thereof.

20.—In conclusion, your memorialits suggest that the foregoing should be made the subject of enquiry by an independent and impartial tribunal, with the view of considering what ought to be done in the premises.

THE MINES OF LAURIUM.

[TRANSLATION.]

SIR,—Owing to an absence of three weeks it is but to-day that I have read in your estimable Journal of Oct. 12 an article referring to the mines of Laurium. Permit me to correct several statements which it contains, and to have recourse to your columns to explain, under, perhaps, a different aspect, the question which has arisen between the Greek Government and the Franco-Italian Company. In a matter so complicated as that in question, in the midst of such varied interests, and of the numerous accusations made by one side and the other, I dare hope, Sir, that you will not refuse to insert this letter, which far from being made up of imaginary and one-sided statements, has no other object than that of re-establishing the facts of the case.

What surprises me most is to see the Franco-Italian Company defended more vigorously by certain English journals than it is by those of France and Italy. The Italian papers, instead of attempting to depreciate in the eyes of the public Greece and its Government, by overwhelming it with invectives, which, under every circumstance, seem to me improper for forming public opinion, content themselves with discussing the question, and some go even so far as to openly blame the Italian Government, and declare diplomatic intervention out of place. The attitude of the French journals, although more decided, are not less moderate. The reference to "the wretched Government of this worthless little country" seems inexplicable, and on reading it one is tempted to exclaim once more, when one sees how readily a Government and a whole people are judged of from a simple dispute relating only to the competence of the tribunals of the country, that "the weak are always wrong, and that might gives right." The Greek Government is, perhaps, less blameworthy than is supposed, and a day will come when light will be thrown on the matter, and it will then be seen on which side is the wrong. Because Greece is small, because she cannot do that which other powers can do, should she be borne down with insults, and be always charged with wrong, even when it shall be evident that she has acted as every other European State would have acted under similar circumstances? This "worthless little country," as it is called, has, at least, made more progress in 40 years than many others, when one thinks what Greece was in 1830, and when it is recollected what was published in 1833, and by an Englishman, too, the nephew of Admiral Cochrane. Instead of judging Greece lightly, and with unjust severity, it were better to read the work mentioned, and see what she is at the present time. It were better to discuss peaceably the questions which present themselves, to state the wrongs that she may have, to give her the counsel she is in need of, and to be at the same time just. But leaving on one side all that does not treat directly of the Laurium question, we will turn at once to the matter of the contestation which has been going on for some time between the Greek Government and the company.

Most of the journals which have referred to this question only see one subject of contestation, and confound, so to speak, the slags, "fausted ore," "halvans," or tailings (scvolades), and consequently misstate the facts. The difference which has brought about the intervention of France and Italy (to be plain and not to facilitate false interpretations) ought to be divided into two parts, the one as to the slag or residue from the ancient smelting operations; the other as to the halvans, which form the chief subject of dispute. The law which regulates mines in Greece has been borrowed from France, and was voted by the Greek Chambers in 1861, the Government not having been able to attend to this part of the administration, owing to more pressing wants which demanded their care. The Greek law is almost a translation of the French law of April 21, 1810; that which forms part of the minein France also forms part of it in Greece; that which by French law is excluded is equally excluded by the Greek law and also by the Belgian law, which contains the same provisions as the others. And I find in the book—"A Treatise on the Law Relating to Mines," by Sir R. P. Collier, formerly Attorney-General, a principle which I think it useful to quote. It is—"Cuicumque aliquid conceditur, conceditur etiam et id sine quo res ipsa non esse potuit." The concession of a mine, then, comprises what is absolutely necessary for the exploitation and nothing more. It is contended that it was Mr. Serpieri who discovered the value of the scories. Nevertheless, scarcely was the law of Aug. 22, 1861, voted, when Mr. Pachys, a Greek capitalist, petitioned for a concession for the re-smelting of the slags. The Franco-Italian company did not apply for their concession until two years later by their petitions of Oct. 13 and Nov. 12, 1863. On the application of Mr. Pachys, the Greek Government did not think itself capable of granting the concession. The slags, in fact, were not included in the mining law of 1861, which treated only of mines properly so called, and did not allude to matters which having been already worked and smelted had been abandoned on the surface. The French law of 1810 did not include these matters any more than the Greek law. When Messrs. Serpieri and Roux applied for the concession of the scories made in 1863, the law which would regulate the working of them had not been voted. There had, moreover, been an action pending before the Court of Appeal at Athens with regard to the proprietorship of the estates upon which the slags were lying. The Greek Government contended that these estates belonged to it as State forests, and the Commune of Laurium likewise claimed the property in them. It was for these two reasons that Mr. Serpieri signed before a notary in November, 1865, and after having obtained the concession of the slags, a declaration by which he promised to submit to all taxes fixed by the law, *or by a law to be made* on the said lead, to guarantee personally, and by the moveable property of the company at Laurium, the payment of the tax for the quantity of lead shipped at Ergasteria; he declared at the same time that the exportation of the lead in question should not prejudice in any way the rights which the Government might bring to bear either upon the lead or upon the slags.

The Greek Government is reproached with damaging in every possible manner the prosperity of the country, and throwing obstacles in the way of foreign companies which would establish themselves. The Greek Government, in consequence of the litigation pending with reference to the Laurium properties with the Commune, and of the law which had not yet been voted for the working of the slags, which, as already mentioned, were not included in the mining law of 1861, refused in 1861 the concession of the slags to a Greek subject, Mr. Pachys. But did the application of Mr. Serpieri likewise meet with refusal? No. The Greek Government granted him the concession, but on the condition that he should sign the declaration above mentioned—a declaration in which Mr. Serpieri foresaw the future law and the decree which might be pronounced by the Court of Appeal at Athens, before which the action between the Government and the Commune of Laurium was going on. The Government, not wishing to obstruct the operations of the company, permitted the commencement of works at once, but it wished at the same time to protect its rights. The law referred to in the declaration of Mr. Serpieri was voted April 14, 1867. The Government by virtue of this law is authorised to leave to the company the slags recognised as State property, and this law levies upon the net produce of slags generally, or of the lead extracted therefrom, an export duty of 10 per cent. It levies also an additional 20 per cent. upon the slags which might be recognised as State property. The decree of the Court at Athens of Dec. 17, 1867, declared three of the disputed localities at Laurium to be State property. The Government relying upon Mr. Serpieri's declaration upon the law of April 14, 1867, and upon the decree of the Court of Athens, claimed from the company the payment of 10 per cent. upon the slags generally, and the additional duty of 20 per cent. upon the slags recognised as State property, and the company at once refused to pay the additional duty of 20 per cent. The 80,000*l.* which the *Mining Journal* says has been claimed by the Greek Government upon the slags and tailings is claimed solely upon the slags, and in virtue of the law of April, 1867, and of the declaration signed by Mr. Serpieri himself on Nov. 30, 1865. The Greek Government does not contest the validity of the concession to Mr. Serpieri as to the slags; it claims that which is due to it, and the company obstinately refuses to make the payment of the duty that it owes. So much for the slags.

But it is the "halvans" which form the principal source of dispute; it is, however, simply a question of the interpretation of the Deed of Concession. France and Italy have intervened upon the administrative decree which has forbidden the company to work the "halvans." Now, England has shown more than once that she will not enter upon questions of this kind. When English subjects have litigation with the Government of the country wherein they have established an industry they are left to the tribunals of the country. England understands that she cannot ask a State to grant guarantees to foreigners which the subjects of that State have not, nor cannot, have. It is contended that the Greek Government ought to have cited the Serpieri-Roux Company before the tribunals of the country instead of voting the law of 1871; but this accusation appears to me unsustainable. When an administrative decree affects a company or a private person upon which of the two is it incumbent to take action—the Government, or the party who believes himself wronged? The party wronged. The company ought then to have laid its complaint before the tribunals, and the Government would only have had to become defendant. The company, however, instead of adopting the course open to it, preferred to have recourse to diplomatic intervention. Mr. Serpieri, on April 6, 1864, applied for, besides the slags which have been conceded to him, the exploitation of the ancient mines of Laurium, as well as the ores of argentiferous galena found in stopes (or between the old workings=*les intervalles*). The council of mines, considering the application of the company and the three specimens of ore deposited in support of the petition, according to the mining law of 1861, that is to say—1, a lump of argentiferous galena embedded in limestone; 2, another specimen of the same metal taken from the vein and enclosed in schist; 3, iron ore embedded in limestone made, on July 11, 1867, the order from which I extract the phrase, "Let there be conceded by Royal ordonnance to Mr. J. B. Serpieri, in his own name and as representative of the company formed by him, the metalliferous area marked in the plan * * * for the working of argentiferous galena." The company had applied for the slags, the ancient mines of Laurium, and the ores which might be found in the stopes. A royal decree, dated Aug. 23, 1867, based upon the order of the Council of Mines granted to the company what it had asked for, which was for a certain extent of the Laurium district. In every country the concession only embraces what has been asked for in the application, and only that which has been granted by the actual deed of concession. The principle *cuicumque aliquid*, &c., ought, moreover, to be applied to all that is indispensible to the working.

Something else the commencement of operations by the company a German engineer—a Mr. Gobanz—sent to inspect by the Greek Government, stated in a report dated Oct. 14, 1869, that the company, not content with working the slags, were using simultaneously with these certain ores which they were not taking from the ancient mines of Laurium, and which were not included in the three classes of ore included in the concession. In fact, the specimens deposited by the company with their application were argentiferus galena, whilst the ore they were working (referred to by Mr. Gobanz in his report to the Government) contained, according to an analysis made at the Paris School of Mines, a small quantity of galena and twenty times more oxide of lead. The minerals which the company was working were the "fausted halvans," or tailings or refuse from metalliferous earth, which the ancients found too poor to treat, and which forms now little mountains about the numerous pits of the ancient mines of Laurium. The halvans not being the ore which the company had applied for by presenting the three specimens already alluded to, not being taken from the ancient mines of Laurium, and not being included under the mining law of 1861 (on this point the French and Belgian laws are the same as the Greek law), the Greek Government interdicted the company from working them. Could the principle "cuicumque conceditur," &c., be urged by the company against the administrative order which affects it? Not at all; for the working of the halvans is not at all indispensable to that of the mine, since the halvans are only similar ores to those which are obtainable from the mine. They are not included under the mining law of 1861, because that law only refers to those mineral matters which nature has placed in the earth, or on the surface, and not to those which have been placed there by the hand of man, as have been the halvans. It was necessary for regulating the working of the halvans to pass a new law similar to that of 1867 relating to the slags. The law of 1871 was brought forward then to regulate the working of the halvans which belong to the State, like all metalliferous matters in virtue of regal rights in force in Greece. The question at issue is whether the deed of concession does or does not include the halvans or fausted ore—that is to say, whether the specimens deposited by Mr. Serpieri cover these halvans, which he contends he has the right to work under his concession. We have seen that the halvans are not subjected to the mining law of 1861, and that they are not the ores of which specimens have been deposited by Mr. Serpieri when he applied for the concession. How, then, can they form part of the concession; and how can Mr. Serpieri contend that he has been the victim of spoliation?

And, lastly, the Greek Government is reproached for voting in 1871 a law with retroactive effect. It is easy to believe that this is far from the fact. The halvans, as well as the mines and slags, have belonged to the State since Greece was erected into an independent kingdom as metalliferous matters in virtue of the regal right. It is the same in Bavaria and in other European States. A law was voted in 1861 to regulate the mines, another in 1867 for the slags, and it remained to regulate the working of the halvans, which were not subject to either. The working of the halvans was regulated by the law of 1871, which, as is proved by its second article—"the halvans as belonging to the State are regulated by the provisions of the present law"—has no retroactive effect, but is simply executive, and founded upon a right existing for many years.

Such is the question of the halvans, as it ought to be regarded, if we take into consideration the documents presented by the company, the applications for concessions, and the specimens deposited in support of the applications, in accordance with the mining law of 1861. The difference which has arisen can only be settled by the tribunals, and too much blame cannot be cast upon the conduct of France and Italy, which intervened in a local dispute, and loudly call for European arbitration. I hope, Sir, that you will not refuse the insertion of this answer.

London, Nov. 6. FIAT LUX.

THE ANGLO-BRAZILIAN GOLD MINING COMPANY.

SIR,—I noticed in the Journal of last week that a resolution was proposed at the meeting that the company should go into liquidation. Such a measure, under existing circumstances, would be most disastrous to the shareholders, and it is to be hoped the committee will do all in their power to avert it. It is true, we cannot at the present time get 2*s.* 6*d.* per share on which 1*l.* per share has been paid; but surely because the directors thought it right in their wisdom to close their eyes to the ever-changing statements of the manager in Brazil, and allowed him to waste the remaining resources of the company, we ought not to throw everything up in despair, and let our new property quietly slip into hands only too ready to receive it.

Pittangue, as Mr. Pearson Morrison's own reports show, although operations are so limited, afforded ample signs of becoming a success, and had the works been pushed on vigorously would very likely now be giving profitable returns. Having, however, once made the mistake of writing up all the property, he has adhered to it, and by an occasional discovery of something new, either in the way of jacotinga lodes or so-called improvements in the treatment of the ores, he has gone on until the capital is nearly gone. Our secretary (or, as he pleases to style himself, managing director) acknowledges at last that, to use his own expressive but by no means elegant language, "he was perfectly staggered when he received the report upon Passagem from Mr. Morrison, that the ores above the water level were no good, and that the shafts must be sunk." I have no doubt some of the directors have also been "staggered," although it is not unnatural that our secretary has been more "staggered" than anyone else, seeing that he assumed the responsibility of stopping Pittangue in preference to Passagem, *without consulting the shareholders*, and although, as the Chairman admitted with all his characteristic and commendable candour, "they could *not* expect a secretary to give an opinion of a mine," and although the secretary himself admitted at the meeting his utter inability to do so. This false step is the more inexplicable when we have the secre-

ary's own statement that "he did not go out to Brazil in connection the Anglo-Brazilian Company."

As matters stand, it would be ruinous to wind-up this hitherto unfortunate company. More capital is required to develope the new property, and we must come forward with it; but its disposal should be entrusted to others than our present managers at home and abroad if we are to derive ultimate benefit.

A SHAREHOLDER WHO WAS UNABLE TO ATTEND THE MEETING.

Nov. 12.

SMOKING IN COAL MINES.

SIR,—In the Supplement to last week's Journal I see a rather interesting letter, by Edward Rymer, miner, of Sharlstone Colliery, on Smoking in Coal Mines. In my diary I have a note of visiting the Pentre Colliery, Ystrad, Rhondda Valley, South Wales, on the morning of April 13, 1871; at the time they were fully engaged in clearing up the wreck caused by the terrible explosion of February 24, 1871. My business gave me free access to the lamp cabin, and to the pit bank. Lamps seemed to be exclusively used, and each one cleaned and replenished his own to his taste, while officials noted approval and formally locked them on the pit bank. I counted sixteen men ready to descend the shaft; nine out of the number were unconcernedly smoking their pipes, and of the eight that entered the cage four were smoking pipes as they descended the pit, and others put them in their pockets. Locked lamps in their hands, and blazing pipes in their mouths! I turned from the pit, and asked myself, What of rules, what of lamps? What of Inspectors, and who are managers? In what Mr. McDonald may do at the Durham Conference I have but little faith, while to send the names and description of the wicked offenders "through the coal trade" I am afraid would be a large volume for daily perusal. And may I ask in what part of the earth would he look for a manager to do it? CHARLES BRADLEY.

Leeds, Nov. 11.

NEW ORE—CRUSHING MACHINERY.

SIR,—In going through the contents of a recent number of your valuable Journal—a formidable undertaking now-a-days in consequence of the number of interesting articles therein—my attention was arrested by your description of Mr. Walker's improvements in "working stamps" for pulverising metalliferous ores. I have visited the inventor's works (in James-street, St. Luke's), and was so much pleased with the machine that I advise those who wish to improve their ore-crushing machinery, or to set up new, to do the same; they will find Mr. Walker very courteous and willing to fully explain his invention, which can never be thoroughly understood by drawings. I consider it a great improvement on the present stamping apparatus; he gets rid of all the friction, or rubbing at the back, which means a great saving of power and "wear and tear" of the machinery. These improvements also supersede the present steam and atmospheric hammers, which, however valuable when employed for working in iron, seem to be entirely out of place when used for powdering rock sufficiently fine for washing. In ore-crushing it is a great point to have plenty of *surface*, so that the pulverised material may spread out as thin as possible when passing over the tables.

As strangers may experience some difficulty in finding Mr. Walker's works, for their guidance, I may say, that James-street is a short street running parallel with, and near to, the south end and west side of the City-road, a little north of Finsbury-square, and connects Old-street and Featherstone-street. W. COOKE, Civil Engineer.

N. ENNOR'S GENERAL REMARKS ON STAMPING.

PATENT SPRING STAMPS AT TERRAS MINE.

SIR,—I regret very much that certain of my friends feel it desirable some sort of reply should be made by me to the remarks of Mr. N. Ennor respecting the new stamps at Terras Mine, which remarks appeared in the *Mining Journal* of Oct. 31. I would not do so were it not that the silence of those whom Mr. Ennor has so mercilessly attacked in his letter may be taken as a proof that his statements are unanswerable, and so that silence be misinterpreted. As Mr. Ennor states, "it will be wise in all we stamp promoters to employ no puffers," thereby throwing out a very improper insinuation, I beg to be permitted to state, if "we stamp promoters" do such acts, the promoters of the Patent Spring Stamps are not included in Ennor and Company. If Mr. Ennor's remarks are to have much weight, then we are to entirely set aside the reports of such journals as the *Western Morning News*, the *Western Daily Mercury*, *West Briton*, and others, as well as the expressed opinions of scores of gentlemen who from time to time have visited Terras and seen the Spring Stamps in operation, expressing themselves much gratified at the success of the invention.

I have this day visited Terras, and found four heads of the new stamps at work, and four others are stopped, to be fitted with new heads, the present ones being much worn. The four in work are being driven by a portable engine, 11-inch cylinder, 14-inch stroke, and the steam had gained on to 50 lbs. pressure, the furnace-door being open. These four heads are each making from 110 to 114 strokes per minute. So many persons have remarked—"We admire the stamps, and it is only a question of time as to their general introduction," that there is really no need to be much concerned about what Mr. Ennor may say.

If the Spring Stamps are to succeed we know they must be able to bear any amount of inspection. If they are not at this time an immense improvement in every way over the old style of stamping we do not desire to run them a single day. A new invention will necessarily take time to perfect, and it may happen sometimes that these stamps are stopped for a short time for an adjustment or improvement. If it be Mr. N. Ennor's object to impress on the public that the Spring Stamps at Terras are in the condition as described by him, his object is a most unworthy one. When he visited Terras the stamps were perchance idle, and such alteration being made, but that must have been months ago. JOSEPH WILLOUGHBY.

Plymouth, Nov. 13.

MR. ENNOR ON WILLOUGHBY'S STAMPS AT TERRAS MINE.

SIR,—In consequence of the number of letters of enquiry received from shareholders and others interested in Willoughby's Spring Stamps and Terras Mine, relative to a letter which appeared in the Journal of Oct. 31, alleging that the above stamps were not only not in operation, but had been removed from the mine,—we hereby beg to give our most unqualified denial to the report alluded to, and to similar accompanying insinuations about Terras Mine, which are equally untrue. Should a similar allegation appear again we shall feel it our duty to take the usual legal proceedings in order to secure a proper settlement of the question.

J. G. MARTIEN, Contractor.
W. J. MARTIN-CALDER, C.E., Company's Resident Engineer.

A FIGHT FOR THE FOUR-WEEKS MONTH.

SIR,—There are several kinds of fights. There is the pugilistic fight, in which at times limbs are fractured, eyes blackened, and injuries of a more or less serious nature inflicted; and there is the verbal fight, in which no blood is shed, but when at times moral evil is done by that member which no man can tame. The fight I refer to was not a sanguine one, nor was there, that I know of, any moral mischief. The contest was a more rational one; there was no abuse on either side, reasons *pro* and *con.* being advanced with great earnestness, but in good temper. The scene was New Great Consols; the parties, the manager of that mine of the one part, and the miners working there of the other part. The miners demanded the four-weeks month instead of the old mode of paying 12 times per annum, which involves a five-weeks month every quarter. On Saturday last (pay-day) the men "struck," declining to work any longer except under the four-weeks system. The manager, on the other hand, argued that time was saved by retaining the old mode, as so many days per annum were not wasted in drink, &c., as are wasted in the new, or four-weeks mode. It makes at least about eight days difference, for men generally waste two days upon every payment—*i.e.*, the Friday or Saturday when paid and the succeeding working day. The manager, who is a very cool, reasonable man, and does nothing rashly, declined to advance them the usual subsist on Saturday, because they would not re-take their bargains. To-day (Monday, Nov. 11) about 40 of the men went to the dressing-floors, and induced all the workers there to drop their tools, so that, except by the carpenters, smiths, and enginemen, all labour was suspended for the day. The manager met the men in front of the account-house to hold a conference on the subject. After an hour or two had been spent in argument, the men wanted their subsist, which the manager had with him, were induced to take their bargains once more for nine weeks, on the understanding that should be the last setting on the old system, so that after the expiration of that period the four-weeks month will be adopted in New Great Consols, unless the men express their desire at the next setting that the old system shall remain. Capt. Pryor, in advocating the old system, consults the interest of the company, who would lose in salaries about 50*l.* per month by the alteration contended for. By his promptitude in meeting the men Capt. Pryor has prevented any loss of time to them and the company.—*Nov.* 11. R. S.

P.S.—Since writing the above, word has been brought to me that the men have changed their minds, and will not have the change which they sought for. They appear to admit now the propriety of Capt. Pryor's reasoning against such a change.

"THE SCIENCE OF INVESTMENTS."

SIR,—Money has advanced in value, and the minimum Bank rate stands now at 7 per cent., with a strong probability of its advancing to 8 per cent., or even higher. The bullion on the 6th inst. was reduced to 19,878,810*l.* It has recently been computed that the average annual products of the gold fields of the world amount to 20,000,000*l.*, which are chiefly supplied by America, Australia, and Russia. Of this sum, in 1870, we imported on balance nearly 8,500,000*l.*, and last year 4,500,000*l.*, while up to this date, instead of importing we have on balance exported nearly 1,000,000*l.* sterling. This clearly shows the severity of the demand. It appears that Germany during this year has minted 16,632,643*l.*, and it is affirmed that 4,000,000*l.* in addition will be minted by the close of the year, while German authorities further state that 17,882,000*l.* will be coined during the coming year 1873; thus the coming production of the world will be all but absorbed by that country for the 14 months from Oct. 12 last. The imports of bullion for the ten months ending Oct. 31 last were 24,756,207*l.*, and exports 26,055,396*l.*; while for the ten months of the year 1871 they were respectively 32,358,201*l.* and 27,742,303*l.* The trade of the country seems to be in a most satisfactory and expansive condition. The total imports for the ten months were 293,157,415*l.*, an increase of 17,436,639*l.* over 1871, and of 53,646,541*l.* when compared with the corresponding months of 1870. Our exports for the ten months from Jan. 1 to Oct. 31 present the astounding total of 212,972,398*l.*, and they thus compare with 1871 and 1870—185,925,852*l.* and 166,284,990*l.* As regards our minerals and metals, we may add that for the month of October last, in comparison with October, 1871 and 1870, the following results are established:—

	1872.	1871.	1870.
Bullion	£3,670,458	£7,847,110	£1,905,079
Coals, Coke, &c.	1,301,409	645,838	458,464
Iron and steel wares	3,418,797	2,545,704	1,988,370

With this large volume of trade and commerce the material position and prospects of the country are good, still the high rate of money must seriously affect profits, while the paucity of banking and finance facilities must unquestionably lead to embarrassments unless the exchanges of the chief European centres turn most decidedly in our favour. That a crisis is imminent I do not anticipate (although it looms in the vista), still there is no expansion of freedom in the money market or cheap rates of discount to be expected so long as Germany absorbs close on all the gold production of the world. The feature that affects more immediately the commerce of England, and, in fact, of the whole world, is the absorption of loanable securities, and gold, therefore, stands in general demand; and so long as Germany mints 500,000*l.* weekly, to supersede the silver coinage, so long will the drain continue, more especially as that Government still retains in its possession 58,450,000*l.* of the 94,000,000*l.* paid by France on account of the indemnity. That amount of loanable securities is practically withdrawn from circulation; for that country, like America, keeps no State bank at the service of the Treasury. Hence any surplus in hand is long in finding its way into circulation, and, up to the present time, we have no knowledge of any application of this vast sum of 94,000,000*l.* otherwise than in the payment of 17,250,000*l.* Federal Loan, 3,600,000*l.* Loan of 1859, and 15,300,000*l.* Treasury bills (say) 36,150,000*l.* The bullion market is, therefore, exceedingly sensitive, and is likely to be subjected to severe and constant changes.

It is a matter of congratulation to us, as the advocates of *bona fide* mining, and of home industries in general, to mark the wonderful success attending enterprise in coal, iron and tin, while the gains from lead and blende must also be regarded as highly encouraging. The copper mines also look like advancing, for the market for that metal is firm, and the tone, notwithstanding the high value of money, is decidedly strengthening. Lead is in increased demand, and many mines pay good dividends. It is a source of congratulation to us to know that many of the recent prizes belong to the class of shareholders who have embarked their capital through the agency of London brokers and engineers; hence, resident capitalists are somewhat sore at the successes of absentees from the various mineral fields. Tin is in great request, and prices are likely to rule far higher. This fact is most consolitary to those who pioneer fresh enterprises to public notice, and especially so when we compare the advantages to such mines as the East Balleswidden, which is about to bring its yield to market through the completion of additional stamping and dressing power. The dividends are guaranteed 8 per cent., with a large quantity of stuff at surface ready for returning. The costs of working this property are slight when compared with mining in general, and the expenditure will not be materially increased for a considerable period unless applied directly to productive sources. The costs of drainage, discharge of ores, and dressing will prove light, as there is ample water for every purpose. Thus, the expense of coals and of steam power is wholly dispensed with.

London, Nov. 13. R. TREDINNICK,
Consulting Mining Engineer.

ON THE MINES OF CARDIGANSHIRE.

SIR,—In quoting from letters written by my late brother Matthew, in the year 1851, we have the following, after describing the great mine of Nanty-Mwyn, near Llandovery (out of this county), which still continues very rich and profitable:—

The next mines northward are Llanfair and Rhydtalog, worked on what may be termed a silver lode, as the lode contains 86 ozs. of silver to the ton. These mines have as yet been worked to no very great extent, but have yielded from 30 to 40 tons of ore monthly, within the last 10 years, leaving fair profits. I should say that these mines have yielded from 200,000 to 300,000 ozs. of silver, and 25,000*l.* worth of lead. There are new trials for ore near these mines also, and I omit some of much promise from such a limited paper.

For many years after the above was written the Llanfair Mine continued to return the quantity of ore named above, and was worked under the management of Messrs. Taylor and Sons to the 90 fm. level, where, I am informed, a good course of silver lead is left standing west of the engine-shaft, the mine having been abandoned at that depth, and remained unwrought for many years. It has been taken up within the last few months by a company who intend to drain and work it. If the capital I hear that is provided to do this is the correct one, it is far too small to accomplish the object desired, which is to place the property into a permanent dividend-paying mine. I consider that instead of 4000*l.* a capital of 10,000*l.* should be raised for this purpose. At Rhydtalog, since the year 1851, little has been done, and the mines spoken of "as of great promise" have been entirely neglected.

Capt. Matthew then says:—

The next great mine is Esgair Mwyn. The lode on this mine is said to have been filled with lead 30 feet wide, nearly solid, and although a royalty of 5*l.* per ton was paid to the Earl of Powis, the profits are reported to be enormous. I estimate the mine has returned about 600,000*l.* worth of ore, but in all probability my estimate is under the mark. This mine is surrounded by valuable but unwrought mineral property.

Since 1851 various attempts have been made to drain and sink the mine to a greater depth, but as yet nothing has been accomplished, and until a system of modern appliances have been brought to bear on it for pumping, crushing, dressing, and winding, no great success will attend the efforts put forward to work it. I hear it is now in the hands of a good company, who intend to give it a spirited trial. Should this prove to be true, there cannot be a doubt that this once vastly rich mine will become as profitable and as productive as ever it was. As to the assertion that "this mine is surrounded by valuable but unwrought mineral property," there can be no doubt about the fact; there has, however, been but few trials made since it has been written. A partial trial has been made at Abbey Consols, which mine is now being wrought, and ore obtained in considerable quantities, and will probably end in a success. The South Lisburne, adjoining the Esgair Mwyn, is also being wrought, it looks promising for becoming both productive and profitable.

Capt. Matthew further proceeds:—

The next three great mines are Cwm Ystwith, Logylas, and Grogwinion. Two of these have been making 15,000*l.* a-year profit in the last 10 years. These mines are on the banks of the Ystwyth. I should say Cwm Ystwyth has yielded 500,000*l.*; Grogwinion, 250,000*l.*; and Logylas, 200,000*l.* worth of ore. Frongoch, the next mine to the northward, is making about 10,000*l.* a-year profit, and its yield has probably been 100,000*l.* This mine is distinguished from many others in the district by having a lode filled with rich gossan for a width of 30 feet, and as being the most profitable mine in South Wales.

At the time this was written the Cwm Ystwith Mine was worked by Mr. Lewis Pugh, of Aberystwith, who for a few hundred pounds laid out in the purchase of it and working, is supposed to have realised not less than 150,000*l.* profit from it during the tenure of his lease—21 years. After the expiration of Mr. Pugh's lease it passed into the hands of the Messrs. Gower, and the local management was entrusted to my late brother Matthew Francis. As Mr. Pugh was fully aware that his lease would not be renewed by Col. Powell, it is in no way singular that he should have put forward every exertion that could be devised for extracting all the ore that could be obtained at a profit, and to leave matters in as poor a condition as was compatible with the terms of the lease, and this he really and effectually did, and when the mines were handed over to the new company they were left very poor, and, in fact, they had to open out a new mine altogether, and in order to carry out this, a different mode of working had to be adopted, they having to sink under the bed of the Ystwyth to obtain this object, as Mr. Pugh's agent had extracted all the paying ground then in sight above the bed of the river. The necessary work, however, was at once proceeded with, and at first it proved to be a matter not so easily accomplished as it was supposed to be. ABSALOM FRANCIS, M.E.

Goginan, Aberystwith, Nov. 12.

[*To be continued.*]

NEW WHEAL LOVELL.

SIR,—I cannot remain indifferent to a wrong impression that is likely to arise from Mr. John Little's assumed forbearance (in his letter to you of Nov. 1), to say anything against Mr. Tyacke or myself, because we—to repeat his choice metaphor—"have thrown sufficient mud at each other." If he has anything to urge against my character or qualifications for the office I sought to obtain let him publish it, or retract his insinuation, though I might have complained with some reason of Mr. Tyacke's circular letter of Sept. 19, because many allegations contained therein were irreconcilable with what I had stated in my printed address to the shareholders, and thereby suggested the unavoidable inference of some misrepresentation of facts. I not only did not resent the implied charge, but did not even answer Mr. Tyacke's circular by simply re-affirming the truth. What ground, then, had Mr. Little for imputing improper conduct to me? Neither to my knowledge is it true that Mr. Tyacke had so demeaned himself in the sense Mr. Little, with so little show of fairness, intends to convey.

Mr. Little is very confident also that no errors or omissions were made in New Lovell accounts, because he happened to be one of the three who were appointed a committee to look into the matter, and because Mr. Parry had also gone through them; but I can inform Mr. Little that, in spite of the vigilance of the triad, some errors and omissions did remain undetected till I accidentally discovered them and pointed them out to Mr. Parry, although I have merely superficially glanced over some of the work. And this circumstance illustrates a truth, of which Mr. Little appears to be not the only one uninformed, that shareholders at their meetings cannot vouch for the accuracy of every item contained in the accounts they pass, but must trust to the competency and integrity of their auditor. No one who has not gone through the same process the auditor of an account has, tracing every transaction therein to or from its origin, can vouch for the accuracy of such an account. Many inaccurate accounts, prior to the late Mr. Tyacke's pursership, one even, I believe, upwards of 1000*l.* wrong, were passed as correct, and the same thing is constantly occurring elsewhere, though they fail to attract public attention unless on a large scale—like the Metropolitan, for instance. In this case, however, I do not attribute anything but want of proper attention, but this should not have occurred when the shareholders had to pay 35*l.* for the work.

Mr. Little also seems to lay great stress on the assumed impropriety of the merchants in their nominating and appointing the agents that are to purchase timber and coal from them; but let him first take the mote out of his own eye, then he will see clearly that tin smelters should not appoint their agents, who might sell them the entire produce of the mine.

Many large capitalists, Mr. Little also affirms, "will not have their names on a cost-book on any account, because they say they never know the extent of their liability." I admit the reasonableness of this objection, and have always advocated a sounder method, feeling convinced that the uncertainty complained of depreciates the investment. But I fail to see any necessary connection between what Mr. Little suggests and the contingency of Mr. Field's pursership. It rests with the shareholders themselves at their meetings to decide whether all the ascertainable liabilities shall be charged up or not. That New Lovell liabilities are now charged comparatively close up is a result attained principally by the votes of Mr. Tyacke and myself, and I may add those of the merchants whose influence is deprecated.

Then, Mr. Tyacke and myself are accused of having thrown our proxies together, and divided the spoil. I dare say Mr. Little is disappointed that I have a share of the pillage; but I have been asked the question why the shareholders wished to get rid of me in the absence of any cause of complaint, after I had adjusted their financial affairs, and placed them on a sound footing, framed for their accurate periodical accounts, and undertaken the principal duties of the pursership. Of course, if they wish me to resign my appointment they will express their desire in a regular way, but Messrs. Little and Field are the last people in the world who should expect from me any self-sacrifice in their favour.

New Lovell, Nov. 11. ONE WHO SHARES A MOIETY OF THE SPOIL.

OKEL TOR MINE.

SIR,—In reply to your correspondent, "One Interested," I beg to send a few particulars relating to Okel Tor Mine, and will leave him and others to judge of the future prosperity of this truly promising mine. Okel Tor, in the parish of Calstock, Cornwall, is situated on the River Tamar, and has a quay where vessels of 200 tons can load and unload, so that the expenses for cartage are necessarily very trifling, which is a great consideration for all mines. For some years the mine was worked for copper, and upwards of 40,000*l.* worth of copper ore was sold; and had that metal been of the same commercial value as at present the mine would have paid very handsome dividends; but although the ore found was of a good quality, and some of the lodes very productive, still those who had the management of the mine always considered that they had not discovered the main copper lodes of the mine, as there were indications that richer lodes most probably existed. Workings were, therefore, carried on for the discovery of this rich lode, and assistance to this has lately been given by the cutting of a rich and large gossan in making the new mineral railway from Calstock; and on dialling this gossan it was found to run through Okel Tor Mine, and from its size most probably to cover the main copper lode of the district; to prove this a new adit has been driven, and after passing through very favourable ground has now reached a beautiful white soft killas, spotted with mundic, and of the most promising description, and this white killas, in the opinion of practical miners, is the sure indication of a rich lode, and as some fine stones of copper ore have been ploughed up from the ground above this white killas, the lode underneath may be considered to be one of copper. This adit is being driven with all dispatch, and the discovery of the champion copper lode is shortly expected. Cross-cuts are being driven in the different levels to intersect the same lode.

While exploring for new copper lodes, about two years since, tin ore was discovered in this mine, and on opening out the lodes the samples taken from the different levels were of such a quality as to warrant the erection of plant and machinery for working this as a tin mine; and though the nature of the ground, being on the side of a steep hill of rock, made it a most difficult matter for the formation of tin floors, yet all obstacles have been overcome, and Okel Tor will now bear comparison for its perfect floors, machinery, and plant with any mine of similar size in the kingdom; and though at first 12 and then 24 stamps were erected, yet by delays and other impediments incidental to the turning of a copper into a tin mine, stamping has been done only to the proportion of four stamps constantly working, but these have produced in 18 months tin which has been sold for 595*l.* 10s., and when this is contrasted with the produce of the richest mines working over 100 stamps, few can compare with this result. The ore is now being raised principally from the 80, in the end and bottom of which a magnificent large lode has gone down, but this lode is too far from the present shaft to enable sufficient stuff to be trammed and raised to keep all the stamps going full time. A new shaft going down upon the lode is necessary, and as the lode improves in depth another level at 100 fathoms would give still richer stuff than that now being worked.

A new shaft can be made both economically and expeditiously, as there are stopes opening from the 80 to the 65, 50 and 35 fm. levels, which could be made use of for the new shaft. When this work is carried out there can be no doubt but that Okel Tor will be one of the best tin-producing mines in Cornwall, and as there are already plant and machinery sufficient to produce 20 tons of tin per month, the prospects of the mine are exceedingly favourable; the shaft and levels are in the most perfect condition, and the plant generally, which has cost several thousands of pounds is of the best possible description. A stack, 70 ft. high, with 1500 ft. of flues and chambers for catching the arsenical soot formed in calcining the tin ore, has been erected, and arsenical soot to the value of 73*l.* 6s. 9d. has already been sold.

It will be seen by the foregoing remarks that a very large outlay must have necessarily been occurred to bring Okel Tor into its present perfect condition as a tin mine, and an outlay of additional capital in sinking a new shaft to a deeper level is all that is required to enable the adventurers to realise very handsome returns for the money they have expended. And in addition to this they may look forward with almost absolute certainty to their mine returning very large quantities of copper ore.—*Nov.* 12. A WELL-INFORMED SHAREHOLDER.

THE WHITEHAVEN IRON MINES.

SIR,—As prior engagements prevented my replying to "Shareholder" and Mr. R. Symons last week, will you kindly allow me space for a word in next week's Journal? I will first say I have not been to Eskdale. My letter, therefore, entirely refers to Floutern Tarn. "Shareholder" says my statement is untrue, but what the miners are to do at Lowes water or Whitehaven he is at a loss to conceive. If he is really a resident of the locality, although afraid to give his name, I may, perhaps, know him. I am as yet unwilling to believe there are any shareholders in West Cumberland. He, no doubt, knows the tramway has been surveyed on two or more occasions to join the Whitehaven line at Rawvale—not a word about going to Cockermouth, as Mr. Symons says. "Shareholder" says Eskdale is to be properly developed before Ennerdale, and further on he says the latter is being proved. This must be either throwing dust, or blowing hot and cold at one breath. He admits Flontern Tarn is being proved, and on this part I take my stand. If miners are wanted, and they obtain lodgings at Ennerdale or Lamplugh, their walk to Waterfall will be from six to seven miles forth and back, or about thirteen miles both ways. I am certain there is but little room in those villages for lodgers. There

are the village shops, in which 1s. must be paid for 9d. worth at Whitehaven. I again repeat, those who live in the mine cottages would go to Whitehaven, *via* Loweswater, a distance of as many miles as I before stated, for food. "Shareholder" says I am quite right in advising the miners to have their cottage agreements right. I said nothing of the kind. I advised them, before leaving their comfortable homes, to have an agreement for their 30s. a week, irrespective of contracts. I did this to prevent any irregularity. I do so again, and to be paid their expenses from home to home. I hesitate not to say that the men who may go from Devon or Cornwall to Floutern Tarn will find their difficulties exceed my former statement.

"Shareholder" says the wisest step will be the making of a tramway, no difficult or expensive matter. How does he know it can be made? Must you not obtain a parliamentary grant? Do the 18 months laying open the veins sufficiently warrant the large outlay in making this 16 months talked about tramway? On whose advice will the company lay out this money? Has any man reported on this property who knows mining proper? My remarks will, no doubt, bring a word from Mr. Symons, who in his Nos. 1 and 2 letters said nothing about a railway to Cockermouth; he said it was eight miles to Whitehaven, I say it is over 16. Am I to understand Mr. Symons to advocate further capital, supposing the 95,000*l.* to be insufficient? If so, what part of the works would he explore first? Would Mr. Symons lay out any of his own money were it his own property. It seems by his letters I am correct about miners' difficulties until the proposed railways are made?

J. HODGE.

SQUATTERS.

SIR,—The above word is the designation applied by "Argus" to the workers on the stanniferous slimes and sand flowing down the Red River Valley—the boundary between the parishes of Illogan and Camborne. We shall be able to determine the propriety or otherwise of its application by reference to its lexicographical signification. Blackie says—"Squat. 1. To sit down upon the hams or heels, as a human being.—2. To sit close to the ground, to cover, as an animal.—3. In the United States, to settle on another's land without pretence of title; a practice very common in the wilderness.—4. To stoop or lie close, to escape observation, as a partridge or rabbit—hence 'Squatter,' one that squats." I apprehend it is in the third sense "Argus" applies the word, regarding the workers in that valley as mere trespassers—in the same way that the Americans take possession of pre-unoccupied land, and acquire a title by such possession. In England there are a few, but rare, instances of this acquisition of right by mere occupation. I know one instance of it in this neighbourhood where a gentleman acquired a field in that way. But the term "squatter" is not applicable to the workers in the Red River any more than to the lessees of any of the mines whence the slime and sand are derived. They have a lease for a term of years from the lord, who has the right to grant, and pay dues on the tin sold, the same as the lessees or shareholders in Dolcoath, Tincroft, Cook's Kitchen, or any other mine on the river, and their position and pursuit are as respectable as are those of the companies who break and raise the tin to the surface. I believe that "Argus" applied the term offensively; but your readers will see that the workers on the river are no despicable men. They are not only following an honest occupation, but a successful one—some of them clearing a profit of 400*l.* or 500*l.* per month, and this despite all the efforts of the mining companies to prevent the tin from flowing down to them. Some of these workers have laid out thousands of pounds in machinery, frames, &c., to enable them thus to realise profit, and are still expending money in the extension of their operations. A walk along the Red River from West Frances to the sea would be interesting to many persons; and I intend to take it myself, and to report to the *Mining Journal* the result of my observations.

R. SYMONS.

Truro, Nov. 12.

THE ROSEWARNES—THE PARBOLA MINE.

SIR,—Your correspondent, "Argus," a week or two since sent you some notes of what he saw in West Cornwall, and in the course of his remarks gave an account of mines in Gwinear—New Rosewarne, New West Rosewarne, North Rosewarne, and Rosewarne United. I quite think that he dealt with each in a business-like and fair manner, and, with regard to the first, I think he was *over cautious*, if any thing, and certainly did not deserve to be treated to the almost vicious letter of your correspondent, "Common Sense;" but what I am rather surprised at is that he should have thought it right to totally ignore the Parbola Mine, which adjoins New Rosewarne, and, to my thinking, has as good prospects of paying dividends in a short time as any of the mines he mentioned, not excepting the famous Treleigh Wood. I fully believe in the three Rosewarnes, but I venture to call attention to their neighbour, and to challenge a comparison.

SECOND SIGHT.

EAST ROCKS MINING COMPANY.

SIR,—In reply to Mr. Johnson's letter, in the Supplement to the Journal of Nov. 2, perhaps you will allow me a small space in your valuable Journal to ask Mr. Johnson a question or two. Now, Mr. Johnson says that Capt. Cock's estimate as to the probable cost of delivery of the ore from Hallew, at Par—5s. 6d. per ton—that it relates to the cost of raising and transit only: why did he not say so in his report? Would not everyone want to know all and every cost before he invested his money? What I wanted to know was the different items named and summed up at Par; but Mr. Johnson seems to be out of temper for my asking this question. Then Mr. Johnson says it is 8s. per ton at Par. Perhaps he will excuse me when I tell him my opinion is they will not do it at much less than three times the money. This, of course, is only my opinion; time will prove who is the most correct. I am informed that there is a steam-engine working at Hallew, and the lode is embedded in very troublesome ground; therefore, it costs the more to get out the ore, it being in a wet, swampy moor—and how can any man report on a lode that is not exposed to view? I ask Mr. Johnson was the lode in East Rocks sufficiently laid open for any experienced miner to inspect carefully and report to the world at the time these reports were written.

A MINING ENGINEER.

OLD BEAM MINE—CORNUBIA MINE.

SIR,—This once celebrated mine is again at work. Like many other old mines, this has had "two or three days." Many years ago—perhaps over 50—it was opened by the Williams family, and it made immense profits. The mine was carried on and wrought to the 82 fm. level below the adit—the adit being 24 fms. below the surface—when it was stopped. Then a local party took it up, and erected a 50-inch engine, and cleared it to the 20, when help was wanted, and a Manchester party (the Messrs. Escricks) came in and cleared the mine to the bottom, and sunk the shaft 10 fms. below the 82, and raised large quantities of tin. But these people also suspended operations. In the reign of the local and Manchester parties I worked in the mine, underground, for the space of 10 years, consequently I know it well, and all its lodes, &c. The ground in which most of the lodes are imbedded is decomposed granite, very troublesome to work, and will require the best and most experienced miner to contend with its successful development. I am informed that the present party are of the highest respectability, and fully determined to open it, for which every encouragement should be rendered. They should not stop short to see the mine below the 92, when I think it will pay well if properly laid open, but time will be required to accomplish this. So much has been said about the Old Beam that it will be very interesting to me as well as many others to see it sunk below the 92 fm. level.

Cornubia Mine is also started again; this has also had "three or four days," and I hope that this may be the best day of its life; in the last working I managed the mine the last 12 months; the shareholders were generally from Leeds. The mine is sunk to the 70 below the surface. The north lode is the main lode, and is 14 fms. north of the shaft at the bottom, and underlies north about 2 ft. in 6 ft., consequently will he always going off from the shaft in deeper levels. Our district is a most lively one, and mining materials are being brought from all directions for the different mines.—*St. Austell, Nov.* 14.

THOS. PARKYN.

BALLISODARE LEAD AND SILVER MINE, SLIGO, IRELAND.

N. ENNOR'S REPORT.

MESSRS. MIDDLETON AND POLLEXFEN, SLIGO.—Agreeable with your request, I visited Ireland, and on Oct. 7 and 8 was at your mine. I found it situated about five-miles from the town of Sligo, and near Ballisodare, in the county of Sligo, and on the edge of the Ballisodare river. The tide washes through the river to within a few yards of the mine. This is a navigable river, and so near the mine as to enable the workers to wheel the ore on board vessels with a barrow, if required.

The out-crop of the lode runs nearly parallel with the river, and dips south to land. I say the lode, but from surface appearance it is two or three lodes running nearly parallel and near each other in a lime-rock formation; when I surveyed the rocks or boulders on the hill side I discovered they were all silicious rocks charged with iron and a small portion of sulphur. It is just such a rock as would be called granite in Wales or Scotland, and in the West of England elvan. I believe this rock abuts, or meets, the lime formation on or near where the mine is open, but the rock is not sufficiently laid open to show the junction. This mine was to all appearance opened and worked many centuries since, and a deal of lead and silver ore returned, as the walls of a smelting-house are still standing, and portions of smelting-furnaces with valuable slags still remain. I noticed there what I never saw in England—the remains of an old revolving mortar-mill, such as is now worked by a horse for making mortar for building, the bottom of which is a large worked limestone flag; this was used for grinding ore. These lodes are worked on for 200 fms. in length, and masses of refuse left, but I could not discover a single shaft. To present appearance it was all worked open to water level. I noticed that two or three cross-cut adits from the sea level were made, but they are now choked up, and I am inclined to think it is not mined far under these levels. I had not a single chance of seeing the lode, as the open places were full of water, and the sides covered with masses of conglomerated lime, produced by water from time to time. I had nothing for my guide but the extensive workings and refuse heaps; in these I was taken by surprise.

I found the ore was not generally such as would suit the ancients; it appeared to be taken from lodes containing good lead and silver, but contaminated with blend, which is sulphurate of zinc, an ore which they knew not how to separate from lead and silver, neither had they a market for it. They appear to have picked out the best of the lead, and attempted to smelt it themselves. They threw aside all the zinc ore as dross, and I have every reason to come to the conclusion that they only worked such portions of the lodes as contained lead sufficient to pay them. In examining the refuse heaps I found many of them to be masses of zinc ore, containing from 8 to 10 per cent. of lead. From what I could see, the refuse heaps contain over 200 tons of zinc ore, all lying on the surface, and I should not be surprised if from 50 to 80 tons of lead could be extracted from these and the slags and other refuse. To do this a crusher and stamper are required. Were a man to take the ore at the surface and erect only temporary machinery to take out the same he would have a good surplus in hand—that is, if he knew his business. I must further remark that water is to be brought to the works from below your large flour mills at Ballisodare by half-a-mile of open cutting to almost an unlimited amount for pumping, crushing, stamping, and for compressing air for working boring machines; the latter machinery may be fixed so near the works that only a few fathoms of pipes to carry the air down would be required for years.

To carry out this mine I should, under the present appearances, recommend the erection of good permanent machinery (including water-wheels), as I am confident the surface appearances warrant such. A large capital is not required, as it is my belief the ancients, from their having no sale for zinc ore, and not knowing how to separate the lead from it, left it in the lode in quantities to pay under our present system of cleaning and smelting. Then I may remark that no steam-power or ore carriage is required in working this mine to any extent. I believe it to be a valuable property if well worked and managed. I discovered that a person took a grant of it about 50 or 60 years ago; but he did not know what to do with ore so contaminated as the lead and zinc ore were at the surface, and he never attempted to open the old mine, seeing the lode running up by the river side about south-east. He opened a new pit on the east end from the single pit. He is said to have sent off a shipload of good lead ore; when it became contaminated with zinc he stopped it, as he could then find no sale for such ore. At the present day the miner knows how to separate it, and the smelter knows well how to smelt it.

Two stones were sent as samples to Johnson, Mathey, and Company (assayers to the Bank of England and the Mint), of Hatton Garden, London. They returned each stone in its undressed state as containing from 40 to 50 per cent. of zinc, one of them 8 per cent. and the other 3 per cent. of lead. The silver in each was as 15 ozs. to a ton of the ore sent. In this case the zinc must contain the silver also, which would make it a valuable ore.

NICHOLAS ENNOR.

St. Teath, Camelford, Cornwall, Oct. 22.

TRESELLYN TIN MINE.

SIR,—I am glad to find that a general meeting of shareholders has been convened for Monday next to take into consideration the past, and to make provision for the future, management of this mine; and it is to be hoped for the benefit of the general body of shareholders that a change will also be effected in the directorship, as the result of the present management of the board is anything but satisfactory. It is admitted by every practical man who has inspected this mine that we have one of the best undeveloped tin mining setts in Cornwall, and doubtless if the local affairs of this mine had been carried on, as at first, without the interference of those who have but little or no knowledge of mining sufficient returns of tin would have been made ere this to meet the current expenditure.

A SHAREHOLDER.

Nov. 14.

HOW NEW MINING COMPANIES ARE FORMED.

SIR,—My attention has been directed to a prospectus of a lead mine not 20 miles from this place, where, as is usually the case, the prospects are most brilliant, and it only requires a small outlay to bring the ore to market and pay the fortunate shareholders large amounts in dividends. Now, I am not going to call in question the accuracy of the reports contained in the prospectus, or the geological position of the mine, strata, or anything of the kind; so far as I know the character, &c., of the lodes, they are well worthy the attention of capitalists; but what I wish to complain about is that 5000*l.* in cash and 5000*l.* in fully paid-up shares should be paid out of the capital of the company to the promoters, who probably have not expended as many pence in laying open the lodes. I do think, Sir, that with the high price of materials, labour, &c., such large amounts in premium should be dispensed with, and the money subscribed by the shareholders be put to develope the property. I am not surprised at the disgust felt and expressed by capitalists who invest in mines when half or two-thirds of the capital finds its way into the projectors' pockets, to the detriment of legitimate mining. There can be no objection to the promoters being paid fair and reasonable expenses, and it behoves the public to be on their guard against such monstrous premiums.

I know of no branch of industry that would pay better interest for money expended than legitimate mining when conducted properly—*i.e.*, the money spent in developing the mines being placed against the returns of minerals; but with the large premiums, and the dodges now-a-days by unprincipled brokers and others, it is no wonder that capitalists seek some other branch of commerce to invest their money in, and thus deprive Cornwall of a vast amount of capital which might be judiciously expended in exploring her mineral resources.

AN OLD MINE AGENT.

Bodmin, Cornwall, Nov. 13.

NEW QUEBRADA COMPANY.

SIR,—As a large and original shareholder in the New Quebrada Company, I have read with very great concern and annoyance the correspondence upon this company which has appeared in the Journal for the last week or two. It seems we have no control whatever over the incompetents who pretend to manage this concern. The non-registration of the property in Venezuela, and the issuing of shares at a monstrous discount, are among the latest charges brought against them. I have perfect confidence in Mr. Hemming's desire to do all he can for the company, but what *can* he do unless the shareholders put him in power? I am getting very weary of the whole affair, but I shall wait one week longer to see if steps are taken to call a meeting of the shareholders, and if by then no steps are taken I will sell every share I have and quit the concern for ever. I do not see how any "eminent firm" dare appeal to the public for capital for the new railway till they can announce that the property is really registered in the company's name.

B. T. S.

Nov. 15.

THE CAMP FLOYD MEETING AND MANAGEMENT.

SIR,—At the meeting of shareholders (reported in the Supplement to last week's Journal) it was gratifying to find the information rendered so fully confirmatory of the opinion repeatedly expressed by the best judges as to the resources and prospects of the company: but, as an attendant in my proprietary capacity, I could not avoid being struck by the fact of the preponderating majority of the board being members of the Stock Exchange, as well as directors of a promising mining company. I was fain to question myself what practical knowledge can these gentlemen possess about the management of mines?—a line of enterprise which, more than most, requires special proficiency on the part of the controlling authority. Supposing that they did possess such knowledge—which they do not—is not the nature of their occupations such as to preclude the close and continuous attention indispensable to the effectual superintendence, and when necessary protection, of undertakings the very best of which are liable to ebbs and flows of productiveness, and always exposed to assault through Bear manœuvres? Last, and not least, is not the conjunction of the two positions impolitic and indecorous—always calculated to produce in jealous minds a suspicion (not totally unreasonable, though I hope, as a general rule, unfounded) that the joint and individual action of a board is not governed exclusively by care for the interests of the shareholders, and that some of them may be tempted to make use of their necessarily prior information as to finds, stoppages, &c., to realise large sums of money, perhaps at the expense of those who have entrusted them with the guardianship of their interests? There is no doubt as to Camp Floyd being a good property; but energy, combined with prudence and practical knowledge, with motives the purity of which cannot be questioned even by the most captious, are all-in-all in mining management. An able well-paid manager, acting with and aided by two directors who could bring time, thought, and some experience to the performance of their duties, and whose position was such as to exempt their intentions from cavil, could do the work far more efficiently than a medley of directors with various other matters to occupy their attention.

It is my unhesitating opinion that an infusion of the qualities here insisted upon—practical knowledge and proficiency—is much wanted in Camp Floyd board-room. At the meeting there were three or four speakers who really appeared to know a great deal more about the management and requirements of the company than the directors themselves. Their remarks incidentally imparted information which the board could not but ought to have been able to give—a circumstance rather humiliating to the respectable body, and surely unsatisfactory to the shareholders.—*Stock Exchange, E.C., Nov.* 15.

A. W.

[For remainder of Original Correspondence see to-day's Journal.]

Royal School of Mines, Jermyn Street.

[FROM NOTES BY OUR OWN REPORTER.]

LECTURE LVIII.—Ores as they come from the mine (continued Mr. SMYTH) are produced in different conditions as to size. There is material small enough to go through riddles of moderate sizes of, perhaps, an inch between the bars, and they are then called "smalls;" and in dealing with these it is an excellent plan to have two different gratings, one a little lower than the other—the first having the bars 1 in. and the second ½ in. asunder, and so divide the material into two classes, according to size alone. It is, in fact, important to begin to separate according to size. There is always a proportion of the stuff so small that it is carried away readily by the water. The ore, however, generally comes down in large masses, and an operation, which is called spalling, is necessary to bring the lumps down to the proper and convenient sizes. A large proportion of this work is done by hand, and the implements used are a variety of hammers, called "spalling hammers," or "cob hammers," and so on, with their heads shaped, and made heavier or lighter, to suit the material to be acted upon. This work is costly as well as slow, and it has been suggested that the lumps should be at once subjected to the action of powerful machinery, but nothing could be worse, as the process of selection ought to be going on from the first, and any such wholesale "spalling" would mix many substances which would afterwards require to be separated. No doubt in some cases it might be feasible—as, for instance, in tinstone or cassiterite, in which it is not necessary to separate rich and poor so closely, machinery might be employed at a less expense than spalling by hand. In such cases Blake's stone-breaker is found to smash up the material excellently, and it has come into vogue where spalling was formerly in use, and is considered a great means of economising human labour. Steam-hammers, too, have been suggested, but whatever class of these mechanical apparatus is employed the object is simply breaking up the material, and it is a grave question whether when this is done by washing the absence of careful picking, which accompanies spalling by hand, is not a greater loss than the mere gain in manual labour. For instance, if we take a large mass of material several cubic feet in diameter, it may be found, on examination, that a stroke or two of the hammer may take off, or out, its most valuable part in the shape of prill ore, other parts producing second-class ore, while the rest is utterly valueless. Such a separation is manifestly better than by powerful machinery to smash down the whole mass into small pieces, and have to submit the whole to those more delicate operations which should be applied only to the best ores.

In addition to spalling and picking, washing is sometimes absolutely necessary before spalling. In some silver mines the ore is extremely apt to be clogged with muddy and argillaceous matter; in fact, so disguised by dirt as to make it difficult to see what it is composed of. For this purpose a variety of apparatus has been introduced; but the simple puddle apparatus used in Australia is as good as any, by which the stuff is dragged round and round by horse-power in suitable water-boxes, and the clay and mud separated by rakes. At Przibaum another plan is employed; for the clay there being very tenacious and hard to get rid of, a large rake in the centre, turned by machinery, is found to be the most effective plan. One of the greatest improvements in this department of mining was the introduction in the beginning of this century of a crusher, or grinder, in which the whole of the orey material was reduced between cylinders rotating towards each other. This machine was introduced first in the neighbourhood of Tavistock, from whence it spread into Cornwall and Wales, but it was not until some time afterwards that the continental miners, who had been in advance of us in many matters connected with "dressing," borrowed the idea.

The apparatus in question is upon the same principle as the coffee-mill, and is not unlike the machinery upon a larger scale for reducing coal and putting it through the washing process. There are a few points to be noted with regard to the rollers connected with these machines. Generally speaking, they are rather short compared with the diameter, and it is necessary that everything about the apparatus should be of the greatest strength. The rolls, as generally made at the present time, are from 18 in. to 3 ft. in diameter. In the North of England it is customary to employ three pairs of rolls, the first pair being channelled, and the material having been broken up by them to a certain size, it slides down to the second pair, where it is further reduced in size; and it is afterwards passed on to a third pair, which crushes any portion of the material which has not been ground sufficiently fine. In the West of England it is more usual to have only one pair of rollers, and when they are well managed they work better than the triple rollers; but it may be objected that more auxiliary manual labour is required for breaking up the material to a uniform size where only one pair of rollers is used, so that it may be as well to have a small pair for further reducing the material which has not been sufficiently ground. The rollers should be made of the best, or No. 3, cast-iron, and it has been sought to render them still better by employing chilled iron. This, however, not having been found to answer well in practice, the ordinary iron is now preferred: but of the very best quality. Still, such is the friction of the rollers, that after a few weeks wear they will present such a worn and uneven appearance that large pieces of material may be passed through them without coming into contact with them. In some instances the machine is so constructed that an outer shell, which can be renewed when the rolls become very much worn, is fitted to them. For this purpose it is usual to keep several shells constantly in readiness at the works, so that no delay may occur. At some mines each pair of rolls are made of the same length and diameter, but at others it is preferred to make them of different lengths. Thus, at the Devon Consols Mines, where, perhaps, a larger quantity of "dredge" ore was crushed than at any other mine in the world, the first pair of rolls were 34 in. diameter and 22 in. long, while the second were 24 in. long. It is asserted that by making the rolls of these proportions the surfaces are kept in better condition than if they are made of the same length. The crusher in operation at the Devon Consols Mine was capable of crushing 15 tons of the better class of ores per hour; but if the ores are of the poorer description the quantity would be much less, as the proportion of pyrites would be greater. In another case one of the crushers is 30 inches diameter, and only 17 inches long, and the other 24 inches; this machine is capable of crushing 20 tons of a certain ore per hour. This amount of work, however, is not by any means that ordinarily performed by these machines, yet they may expect an efficient machine to grind down from 20 to 30 tons in a day of ten hours. Other questions which arise in reference to these crushers are, at what rate they should be made to revolve, and whether the materials ought to be put in dry or wet? These are very important questions, but no *à priori* answer can be given to them. It has been settled that the circumference of the rolls should not revolve at a less speed than 30 feet nor more than 80 feet per minute, the average being about 48 feet. If they revolve at too low a speed a proper amount of work will not be obtained from them, and if the speed be too great the material will pass through without being properly crushed. Water-power has frequently been employed to turn the rolls, the latter being connected with water-wheels, intermediate gearing having to be employed to secure a proper speed. With reference to the introduction of water, it cannot be denied that in some cases this is a decided advantage, as it facilitates the grinding very much. With some materials, however, it would not be desirable to introduce water, such as argillaceous ores, which require washing before submitting to any treatment whatever, as it would be found that if they put them into the hopper with water they would be pounded into a tenacious mass, which would only pass through the machine with great difficulty. But if the ores are associated with fluor-spar water may be advantageously mixed with them, as it will keep the surface of the rolls cool, and will also assist in carrying the material through the different parts of the machine. The latter, indeed, is a great point in regard to the economy of the crushing process, and if the materials to be passed through are suitable, they should enter at one point, and the water, carrying the ores along with it, pass out at a further point.

Whatever the modes of attrituration adopted may be, they must be carried out with a great deal of care and attention when the ores of gold, silver, and tin are concerned. These metals are often disseminated through the halvans in very small proportions. Gold ore is generally reduced to grains of a comparatively large size, but frequently in the case of silver it is necessary to reduce it to a very fine powder for the purpose of amalgamation. The ores of silver, with the exception of the argentiferous galenas, cannot be treated mechanically, as the metal is so finely disseminated through the mass in the form of brittle sulphides, which, on being subjected to the action of water, would not fall to the bottom, but be floated away. Berthier, a French author, has shown that even with the most careful process of washing half the amount of silver originally present in many ores, and particularly those of Mexico, would be lost. This fact was known and recognised 300 years ago in the silver mines of South America, and a miner named Medina, who lived in the neighbourhood of Real del Monte, discovered that by the admixture of quicksilver the affinity of silver for that metal enabled him to obtain from the mass a much larger proportion of silver. This was called the Patio process, and the amalgams usually employed are common salt, mercury, sulphate of copper, and a substance called "magistral," which is manufactured from copper pyrites. The grinding machinery for silver ores in South America, therefore, reduces them to a fine powder. The Spanish "arrastre" (which is now a good deal used in this country, and particularly in the Potteries, for grinding flints) is used for the Patio process. It is a circular trough, in which circular blocks of stone are drawn around by horse-power or by mules.

The flooring is generally made of the hardest chert that can be procured, and the blocks that are driven round are of the same material. Another contrivance is the Chilian mill, which consists of a vertical runner, frequently of granite, revolving on a horizontal arm projecting from a perpendicular shaft, to which motion is given either by water or steam power, or by being attached to horse-gearing. The basin in which the runner revolves is slightly conical, and may be made either of stone or cast-iron. In this arrangement the grinding area is regulated by the difference of the circumference of the circle described on the bedstone by the inner and outer edges of the runner. In the majority of cases the Chilian mill, instead of having only one runner, has two, one on each side of the vertical shaft, and in such mills they are fastened at different radial distances from it. The method of working rock by the Chilian mill is very much like that employed with the arrastre, but the former is now seldom used, as the latter is generally considered to be a more economical and efficient machine. All the contrivances for crushing which have been introduced have not, however, superseded the old-fashioned "stamps," which have stood the test of centuries, and which we will consider in our next lecture.

NATIONAL MINERS' ASSOCIATION.

The Annual Conference of the various branches of the National Miners' Association was opened, on Monday, in the Town Hall, Durham, under the presidency of the Chairman, Mr. Alexander McDonald, who, in opening the business, commenced by reviewing the past history of the association, which had grown until now it numbered no fewer than 86,871 members, a feature of organisation complete in its individual parts, and, he would make bold to say, second to none in the civilised world among working men. He also recapitulated the labours of the association, and the beneficial results which had been accomplished through its instrumentality. As to the Mines Bill, he expressed his belief that it would be an excellent measure if carried out in letter and in spirit; and the carrying of it out, he might also add, would, in a great degree, depend upon the working miners of the country themselves. Up to the present time, however, they had had but few indications of what the law was, or how it had to be administered; but now, if the *Mining Journal* spoke correctly, they were favoured with the views of three of Her Majesty's Inspectors. He trusted the report was not true, but, if it were, it would meet with the most unqualified condemnation of the whole mining community, and would make them look upon certain portions of the Bill as a mockery, a delusion, and a piece of legislation that was altogether opposed to common sense. (Hear.) The paragraph professed to give a report of an important conference amongst the members of the Lancashire and Cheshire Coal Association, recently held in Manchester, and part of it read as follows:—

"Messrs. Dickinson, Higson, and Wynne, three of Her Majesty's Inspectors of Mines for the district included in the association, afterwards had a conference with the members present on the subject of the New Mines Act"—

It was somewhat singular that the Inspectors never appeared at the workmen's conferences, although they always contrived to find their way to those of their masters; and hence it might not be unfair to ask whether their inclinations did not lay in that direction? ("Yes, yes," and applause.) Well, the paragraph continued—

"And intimated, without in any way committing themselves, or being supposed to give the views of the Home Office, that, as to certified managers, foremen, or underlookers of collieries were not the persons intended by the Act to be certified managers, and that the words 'constant supervision' in the Act do not mean constant daily inspection."

Now, if that was the reading of the statute they were no further advanced in the matter than they were, and might as well have no manager at all. What did the statute say? Why, that "every mine to which this Act applies shall be under the control and daily supervision of a manager." The Government officials said that the words "constant supervision" in the Act did not mean that it should be "constant daily inspection;" but if the daily supervision of a manager was not constant daily inspection, then he would ask what in the name of common sense the Act meant at all? If such an interpretation of the Act was a correct one, he concluded that the portion to which he referred was little less than a delusion and a snare, and he trusted before they separated that they would give the strongest expression to their disapproval, and avow their readiness to again go into the trenches for a renewal of the battle for their rights. They must have the Act carried out fairly. Many of them had spent the better part of their days in agitating for a law which should conduce to the interests and welfare of the working miners, and on these grounds they could not allow three Government officials to come forward with an opinion which was inimical to the spirit of the Act, and inimical to the spirit of that which they had so long striven to obtain. * * * * He had for some time been glad to see that the wages were so good, and that they had been in the highest degree calculated to promote the happiness of the people; but more especially was he pleased to find that their friends in Northumberland had for some considerable period been proposing to try the experimont of becoming coalowners as well as coalworkers. The idea was a most laudable one, and for his own part he thought that when they could organise and manage such large bodies of men as they were doing there could be no objection to their striking out in this newer and higher ground of co-operation. He would be very glad to see them go into it for collieries, as in that they would have the best guide for the regulating of their fellow-workmen's wages; and, besides all this, it would have a powerful effect in making them even more provident, sober, and self-reliant than they were at present. They had now got an Education Act which it was their imperative duty to carry out, and if they did so they might depend upon it they would very speedily remove from their class the charges of drunkenness, idleness, and ignorance with which they were now too freely saluted. Every miner's child ought henceforward to be properly taught and disciplined, and in this way prepared to fill the higher offices which the new Act placed within his reach.

Mr. THOS. BURT remarked that the Mines Regulation Bill, with all its shortcomings, was by far the best piece of legislation which had ever been passed in the interests of any one body of workmen since the country had an existence. If it were honestly carried out—and the men would endeavour to see that it was—it would be a boon to thousands of hard-toiling working men and boys in every part of the kingdom. Much has latterly been said about the high price of coal; and many persons had even gone so far as to assert that this was owing to the men's restriction of labour on the one hand, and to the extravagance of their demands on the other. Now certain circumstances had taken place, and were still taking place, that might have tended materially to lessen the produce of coal. First of all, there was the shortening of the hours of the boys, which lessened the drawing time at the pits by 1½ hour per day; but surely the most devoted worshipper of mammon would not say that they had thus gone too far in the direction of humanity. It was high time that such a reduction of hours did take place; and he was glad to think that, in less than two months more, a still further decrease would have to be made in the interests of these poor boys. And the means of lessening the produce might have arisen through the extra difficulty now experienced in working the coal—the men having been gradually driven from 5 feet or 6 feet seams to those of only half their height—but still, not notwithstanding these probable causes of a diminution of the out put, he was himself one of those who believed that no decrease had taken place. Instead of any decrease, in fact, he was one of those who believed that the yield of coal had actually increased. He had recently seen, that day, the first nine months of the present year, the exports had been 9,824,876 tons; while, for the same period last year the amount was only 8,715,271, and thus an increase of 109,605 tons was clearly shown. In addition to this increase of exports, there had been, consequent upon the exceptional briskness of all sorts of trade, a much greater home consumption; and, therefore, he was of opinion that it was nothing short of a libel upon a hard-working and industrious class of men to be continually charging them with restricting and neglecting their labour. He also denied that the men had been extravagant in their demands—never having got more than one penny per ton when the coals had gone up a shilling—and hence it was not surprising that these men should still be saying that they had not got all to which they were entitled. After eloquently appealing for a proper recognition of the claims of labour, and urging the men not to depart from their present sensible and conciliatory method of settling disputes; Mr. Burt referred at some length to the subject of co-operation. He was quite of opinion that the miners should have collieries of their own, and he was equally of opinion that they could do so if they were so determined. It was stated on good authority that there was at present in the banks of Newcastle nearly 500,000*l.* belonging to working men—(hear, hear)—while there were nearly fifteen millions belonging to them in other parts of the country. What was this money doing? It was working somewhere; and, although giving the investors some 2½ or 3 per cent., it was probably making for other people as much as from 15 to 50 per cent. Now, why not use this money themselves? Well, it was because they lacked confidence in each other, and because they had no confidence in the men whom they elected to represent them. If they could only get over this weakness, and repose trust in their leaders, they would soon have collieries and other things of their own. The men of Durham had accumulated 18,000*l.* in a very short time, and the men of Northumberland had saved 13,000*l.*; but even this was not nearly enough. There were at the present time 50,000 miners in the two counties, nearly all united; and therefore they had a great power in their hands. Now, allowing that there were 10,000 of these who could not, under any circumstances, save anything from their wages, there was no denying that the remaining 40,000 could have no such excuse. There could not be fewer than 20,000 who could save 5*l.* each per year; while 20,000 more, being unmarried, could, without the loss of anything that was worth having, save at least 20*l.* each. If this were done—and he saw no reason why it should not—they could raise in one year a sum of 500,000*l.*, and thus gain the means of purchasing one or two collieries at once. They might depend upon it that such a plan would be the best means of solving all their difficulties, and would act as an educative process that must be productive of good. It would show them some of the difficulties as well as some of the advantages of capital, and this would act as a complete barometer, so to speak, of the state of the coal market. It would teach them at a glance what really ought to be their wages—whether they should rise or fall, and in that way would prevent them committing errors which they might all have cause to deplore.

The CHAIRMAN considered the reports of the delegates highly favourable, although in one or two instances they had had to refer to attempts to crush the Union, to the lack of ventilation, and other matters which seriously affected the health of the men. Allusion had also been made to the manner in which hospitals had lately been erected in various parts of the country, and much, no doubt, had been said in some quarters concerning the munificence of the donors; but, for his own part, he would rather see the necessity for such places prevented. If the owners would only clear the mines, and make everything fit and right, there would no more need for hospitals in mining districts than there was in any other.

MINES REGULATION ACT.—The CHAIRMAN then rose to tender the report of the Parliamentary Committee in connection with the Mines Regulation Act. He traced the history of legislation up to the beginning of 1872, and added that when the miners then saw a measure framed upon the amendments which they themselves had drawn in previous years, they hailed its introduction with the greatest delight. There were many small matters they did not agree with, but still, after mature deliberation, they were so firmly impressed with its utility that they could offer no opposition to any material point of it, and even went so far as to offer to support the Home Secretary in carrying it through. Compromises had had to be made during its progress through the House, and not a few beneficial clauses had been lost; but still, despite their anxiety for a perfect measure, they wisely accepted all they could get, in the hope that it would not be long before they secured more. They had been upbraided with not keeping the education clauses in the Bill. The answer to this was simple. The question of education was being dealt with nationally, and, therefore, why need they cumber their Bill with the subject, when their boys were going to be included in the Act that was to be applied to the whole population? The Mines Bill, as it now stood, was by no means a bad one; and, if it was only carried out in its letter and spirit, there would be no necessity for seeking a change for a number of years to come.

COMPENSATION BILL.—The CHAIRMAN next called attention to the Compensation Bill, and to the struggle they had had to get it to the door of the House of Commons. It was high time the mine owners should be made responsible for the misdeeds of their managers; that they should no longer be allowed to escape the payment of compensation on the plea of its not being the act of a fellow-servant, and, therefore, they ought again to press the matter before the House for a settlement.

Mr. CRAWFORD proposed, "That this meeting views with regret the continued sacrifice of human life constantly going on in the mines of this country, and also the great difficulties which at present exist before compensation can be got; and, further, believing that many of these accidents occur in consequence of ignorance and negligence on the part of agents employed by mine owners, we would urge the Government to introduce a Compensation Bill making mine owners responsible for the doings of each and every one of their agents employed in and about the mines."

Mr. JACOBS seconded the motion, and it was strongly supported by Mr. SHEPHERD and Mr. KING, the delegates from the mines in Cleveland. Both gentlemen complained of the want of inspection, and of the awful number of accidents that occurred; but they were of opinion that if compensation could be claimed it would tend very materially to diminish the list of casualties.

The CHAIRMAN pointed out that the Bill would need to be narrowly watched, as there was already a powerful interest in the House of Commons who believed that the law of compensation pressed too heavily upon them. Every effort would be made to destroy that portion of the Bill that applied to these people, while the shipping interest would be equally on the alert to get rid of the responsibility which attached to them. The resolution struck at the root of a great evil, and ought to be zealously supported as a deterrant to evil doers. No one could have read the evidence of the Morley accident without seeing that it arose from negligence, and that it was a clear case for compensation; but still, such was the character of the law that it was almost impossible to reach even the most culpable of the mine owners.——The resolution on being put to the meeting was unanimously agreed to.

MANAGEMENT OF MINES.—The CHAIRMAN then alluded to what he considered a piece of extraordinary conduct on the part of three persons, holding the office of Inspector of Mines, with regard to their construction of the statute, which affected very materially the interests of the working men. It had been put forward as the opinion of Messrs. Dickinson, Higson, and Wynne—"That, as to certified managers, foremen, or underlookers of collieries were not the persons intended by the Act to be certified managers, and that the words 'constant supervision' in the Act do not mean constant daily inspection." Now, if this interpretation of the statue became its ruling principle it would be virtually worthless; and, therefore, he thought the conference ought not to lose a moment in putting the views of the miners directly and distinctly before the Home Office. It was like a policeman telling them the law instead of the magistrate. To his mind, it was a gross impertinence for these persons, ignorant of the law, to dare to utter an opinion which he believed to be entirely adverse to the intention of the Legislature: but if it should happen that the Inspector's ideas were sustained, the miners should at once inform the Home Secretary that the Bill would meet with hostility from one end of the land to the other, and that they would take every legitimate means of making their influence felt. They had had too much of the interference of Inspectors, and hence the association ought to lose no time in teaching them that they were no more than other servants, policemen, or overseers who were appointed to carry out the law laid down for their guidance.

Mr. NORMANSELL thought they should not be too strong, lest the report might prove to be incorrect, and hence a milder resolution than his friend seemed to indicate would meet the case. He proposed—"That the Conference, viewing with great apprehension and concern the statement just made public, that three of the Inspectors of Mines had defined the Act in a way that will destroy one of its best provisions, is of opinion that the parliamentary deputation should, immediately after the close of the Conference, take some action to ascertain whether or not the interpretation of the gentlemen above named be correct; and if so, the deputation be instructed to correspond with the Home Secretary for a confirmation or a repudiation of the said interpretation; and, further, that the Amalgamated Association be informed of this resolution, with a request that they co-operate with us on this and other parliamentary questions."

After some discussion as to what was contemplated by the Act,

The CHAIRMAN pointed out that the law said, "Every mine to which this Act applies shall be under the control and daily supervision of a manager." This meant that they should always have a competent man on the spot to look after the mine, and see that everything was working safely and satisfactorily.

A long discussion ensued as to who really constituted "the manager," as contemplated by the Act, and not a few opposite opinions were expressed. It was ultimately decided, however, to submit the resolution as read, and it was at once agreed to.

Several speakers afterwards desired that the Association should make a declaration as to its interpretation of this section of the Act: but, inasmuch as they had just been censuring the Government Inspectors for having expressed their opinion, it was thought better to let the subject rest until the working of the Act could be more fairly observed.

CLEVELAND IRONSTONE MINES.—Mr. SHEPHERD stated, and his colleagues confirmed him, that from bad ventilation the atmosphere was so obscured with smoke that workmen could not see their neighbours, and that boys and horses ran foul of the pit timber, or got jammed among the wagons, sustaining injuries that plentifully filled the cemeteries of the district. The delegate named, at a later stage of the proceedings, while another question was being discussed, stated that the record of a year's accidents in Cleveland would startle the country more than anything he knew.——Mr. FOREMAN, of Durham, pronounced the state of the Cleveland district to be barbarous. It was agreed that the Parliamentary Committee should lay the matter before the Home Secretary, a deputation of the Cleveland men to be present on that occasion to furnish any information required. It was also agreed that Mr. Foreman, president of the Durham Union, and Mr. Grieves, president of that of Northumberland, should visit the Cleveland mines, if the consent of the owners could be obtained, in order, if possible, to examine the extent of grievances complained of by delegates from that district.

COLLIERY SPECIAL RULES.—The CHAIRMAN drew attention to the fact that under the Mines Regulation Bill each colliery could have special rules, and that the effect of such rules generally were to shift the responsibility off the shoulders of the employers, and put it on to those of the men. The joint committees of the National and Amalgamated Associations of Miners had, at their meeting held in Leeds shortly after the passing of the Act, adopted a resolution to instruct their various districts to watch that the special rules were duly hung up at the colliery offices, where the men could see them, and that a copy of such rules at each colliery should be forwarded to Mr. McDonald, who was empowered to obtain the services of a solicitor to inspect them if he deemed it necessary.——Mr. PATTERSON after a short explanation from Mr. Normansell, proposed that the resolution of the joint committee should be confirmed, which was agree to. Mr. McDonald, Mr. Normansell, Mr. Burt, and Mr. Shepherd were appointed a committe to revise the rules of the Association.

ARBITRATION.—Mr. ALEXANDER MCDONALD drew attention to the passing of the Arbitration Act of last session, and counselled its adopton as a means of settling disputes and avoiding strikes. It was ultimately agreed to recommend all the local associations connected with the National to use their influence in adopting and applying it before commencing a strike.

THE NEW TIN REGION OF NEW SOUTH WALES.

At the meeting of the Geological Society of London, on Nov. 6, the two following papers (communicated by the Right Hon. the Earl of Kimberley, Secretary of State for the Colonies) were read:—

1.—"*A Report by* Mr. F. T. GREGORY, *Mining Land Commissioner in Queensland, on the Recent Discoveries of Tin Ore in that Colony.*"

According to this report, the district in Queensland in which tin ore has been discovered is situated about the head-waters of the Severn river and its tributaries, comprising an area of about 550 square miles. The district is described as an elevated granitic table land, intersected by ranges of abrupt hills, some attaining an elevation of about 3000 ft. above the sea. The richest deposits are found in the beds of the streams and in alluvial flats on their banks, the payable ground varying from a few yards to five chains in extent. The aggregate length of these alluvial bands is estimated at about 170 miles, the average yield per linear chain of the stream beds at about 10 tons of ore (cassiterite).

Numerous small stanniferous lodes have been discovered, but only two of much importance—one near Ballandean Head Station on the Severn, and another in a reef of red granite rising in the midst of metamorphic slates and sandstones at a distance of about 6 miles. The lodes run in parallel lines, bearing about N. 50° E.; and one of them can be traced for a distance of 9 or 10 miles. The ore, according to Mr. Gregory and Mr. D'Oyly Aplin, is always associated with red granite—*i.e.*, "the felspar a pink or red orthoclase, and the mica generally black; but when crystals of tin ore are found *in situ* the mica is white." The crystals of tin ore are generally found in and along the margins of quartz threads or veins in bands of loosely aggregated granitoid rock, but are sometimes embedded in the micaceous portions. The report concludes with some statements as to the present condition and prospects of the district as regards its population.

2.—"*Observations on some of the Recent Tin Ore Discoveries in New England, New South Wales.*" By Mr. G. H. F. ULRICH, F.G.S.

The district referred to by the author is in the most northern part of the colony of New South Wales, almost immediately adjoining the tin region of Queensland, described in the preceding report. It forms a hilly elevated plateau, having Ben Lomond for its highest point, nearly 4000 feet above the sea level. The predominant rocks are granite and basalt, enclosing subordinate areas composed of metamorphic slates and sandstones; the basalt has generally broken through the highest crests and points of the ranges, and spread in extensive streams over the country at the foot.

The workings of the Elsmore Company, situated on the north-west side of the Macintyre river, about 12 miles east of the township of Inverell, include a granite range about 250 ft. in height and nearly 2 miles in length. The granite of the range is micaceous, with crystals of white orthoclase, and is traversed by quartz veins which contain cassiterite in fine druses, seams, and scattered crystals, and by dykes of a softer granite, consisting chiefly of mica, and with scarcely any quartz, in which cassiterite is distributed in crystals, nests, and bunches, and also in irregular veins of several inches in thickness. The granite yields lumps of pure ore up to at least 50 lbs. in weight. The quartz veins contain micaceous portions, which resemble the "greisen" of the Saxon tin mines. The deepest shaft sunk in one of the quartz veins was about 60 ft. in depth. The author noticed certain minerals found in association with the tin ore, and the peculiarities of the crystalline forms presented by the latter. The drift is very rich, and consists of a generally distributed recent granitic detritus, from 6 in. to 2 ft. thick, and of an older drift (probably pliocene) capping the top of the range, and probably dipping beneath the adjoining basalt. The washing of the granitic detritus gives from 3 ozs. to more than 2 lbs. of ore per dish (of about 20 lbs.) The older drift is rather poor in tin to within about a foot of the bottom; but the bottom layer is in part very rich, some having yielded as much as 6 lbs. of ore per dish.

The author also described the Glen Creek, about 40 miles north of the Elsmore Mine, from the surface deposits of which tin ore has been obtained by washing. The course of the creek is most through a black, hard slate destitute of fossils; but at one part, for about 10 chains, its bed consists of a fine-grained hard granite, with numerous veins of arsenical and copper pyrites, and one solid vein of tin ore, about ¾ in. in thickness, all of which pass from the granite into the slate without any interruption or change, the passage from one rock into the other being also gradual

The chief underlying rock of the district is a black slate, but dispersed through it are small outcrops of a rather coarse-grained micaceous granite, close to one of which several veins of solid tin ore, from 1 to 4 in. thick, have been found traversing the slate rock. The tin ore disseminated through the surface deposits has been derived from these veins, and form a very hard and tough greenstone (diabase), which occurs in large dykes and patches in various places, and is probably younger than the granite. In conclusion, the author referred to the probability that a deficiency of water may prove a great obstacle to the full development of the tin mining industry in this district, but stated that "it seems not unlikely that the production of tin ore from this part of Australia will reach, if not surpass, that of all the old tin mining countries combined."

Mr. DAINTREE commented on the enormous value of the 170 miles of frontage for stream tin works exposed in Queensland. The value of these alone would, according to Mr. Gregory's calculation, be some 13,000,000*l.*; taking an equal value for those of New South Wales, there would be lying on the surface something like 25 times the whole amount of tin annually produced in Cornwall. In addition to this, there were lodes of immense length and richness. At the same time there were large tracts of similar granite to that containing the stanniferous veins still unexplored in other parts of Queensland. What amount also of tin-bearing drift might exist under the tracts of basalt was still unascertained. The tin and other minerals were, he observed, limited to the palæozoic and metamorphic districts traversed by dykes, such as those mentioned in Mr. Ulrich's paper; and although very large areas of granite similar to that of the Severn river were to be found in other parts of Queensland and Australia, the stanniferous portions would be confined to the areas traversed by such dykes.

THE COAL FIELDS OF NEW SOUTH WALES.

The Agricultural Society of New South Wales have, by awarding prizes for the best specimens of coals shown at their Exhibition, afforded the public an excellent opportunity for judging of the quality of the native coals offering in the market. The judges were Messrs. J. Mackenzie (Government Examiner of Coal Fields), T. R. Hackett, and C. Watt. Two first prizes were awarded to the Wallsend and Waratah Coal Companies for their large and excellent exhibits of bituminous coal, applicable for the greatest number of uses—for steam, household, gas, smelting, and coking purposes. These pillars of coal, about 8 feet 6 in. in height, not only showed the thickness of the seam, and the quality of it throughout its entire depth, but they enable them to judge of their value better than by small samples, and give the public a better idea of the vast resources of our New South Wales coal deposits. The judges considered that it would have been invidious to make any distinction between these two companies in awarding the prize, although the pillar of coal from the Wallsend Company's mine was certainly brighter and freer of shale bands than the Waratah specimen. But in making their award they considered it only right to take into consideration the smaller block of coal in connection with the large one exhibited by the Waratah Company, which is of equal lustre and uniformity of texture with the Wallsend. These two pillars of coal come from one and the same seam of coal at a considerable distance apart, and belong to the upper coal measures of the Hunter River district, and geologically speaking, are above the carboniferous rocks containing marine fossil fauna, and the seams of coal and cannel coal worked at Stony Creek, near Maitland, and other places. The coal from the Esk Bank Colliery, Lithgow Valley, was highly commended. The Rix's Creek Colliery, Singleton, sent excellent samples of house, steam, and gas coal, but in too small pieces to justify an award. The steam and smelting coal from Osborne, Wallsend, and Mount Kiera Collieries was highly commended. The valuable petroleum oil shale exhibited by the Southern Light Company, Wollongong, was also highly commended. The New South Wales Shale and Oil Company, of Sydney, was awarded a bronze medal for a specimen of kerosene shale; this is one of the richest and thickest cannel coals yet found in Australia, and yields 150 gallons of crude oil per ton, or about 17,000 cubic feet of gas per ton.

With a view to the still further development of the mineral resources of the colony, the Government of New South Wales have engaged a gentleman lately connected with the Victorian Geological Survey, to survey New South Wales, and define the situation and extent of the coal measures. The geological features of the country will also be reported upon. One of the main objects for which this proposed survey is to be made is to ascertain the whereabouts of accessible coal measures in the districts to the westward of the Cordillera, in view of their being utilised in the development of the other mineral resources. It is already known that coal measures of enormous extent exist between the mountain range and the seaboard; but it is thought that coal fields of nearer proximity to the gold, copper, and tin-bearing country, can be found more available for the development of the mines, and the cost of transit of the mineral materially lessened. Although there are large quantities of beautiful timber, to be had close at hand, mining operations are now being carried on to such an extent that it will not be long before the country in the vicinity of the mines is denuded of its trees. The coal mines in the vicinity of Newcastle, Wollongong, Bulli, and other ports along the coast, are being worked to a greater extent every year. Victoria is apparently without a coal field, and the exports to Melbourne from New South Wales are very great already, and are increasing.

Meetings of Mining Companies.

CHIVERTON MOOR MINING COMPANY.

A general meeting of shareholders was held at the offices, Crosby House, on Wednesday—Mr. MACKAY in the chair.

The accounts, made up to Oct. 12, showed a debit balance of 2919*l.*

The manager's report was read, as also was one from Capt. Josiah Thomas, the opinion of the latter being that the ground below the 100 fm. level was sufficiently promising to warrant its prosecution.

The CHAIRMAN said their experience had been that from the 65 to the deepest level the shoot of ore had gradually shortened, which was in itself a most unsatisfactory feature.

Capt. TREMAYNE said the principal portion of the ore ground was towards Chiverton Valley, being within 30 fms. of that boundary. The south lode could be seen for a very little cost, and should be seen, seeing that at the 40 it was a very fine lode, and very much liked by Capt. Josiah Thomas.

The CHAIRMAN asked what dead work was being done?——Capt. TREMAYNE said the men driving the 60, 70, and 90 were all in dead work, for the purpose of opening the two mines together, the ore going towards the Chiverton Valley shaft as fast as it was going from Chiverton Moor shaft; but as the poor ground was going faster than the lead ground, the latter was evidently shortening. The Chiverton Valley shaft would reach the lode 20 fms. below the 95. If lead could be found in the caunter lodes, the mine would soon pay dividends.

The CHAIRMAN said that could be proved in 10 fms. driving, as from the underlie in the 40, if the lode were not then met, it must be evident that the branches met with was the lode split up; to prove this point would not occupy more than six weeks; and if that failed, he did not think there was a miner in Cornwall who would say the mine had not been fairly tried.

Mr. W. S. SUTTON suggested the desirability of applying to the lords for a revision of the dues.

The CHAIRMAN did not think that question need now be entertained, for when Chiverton Valley was acquired the dues were acquired also.

After some further discussion the accounts were passed and allowed, and with the report, ordered to be entered on the minutes.

A vote of thanks to the Chairman terminated the proceedings.

EAST POOL MINING COMPANY.

The two-monthly meeting of adventurers was held, on Monday, at the account-house—Mr. R. R. BROAD in the chair. The balance-sheet for August and September showed that 3788*l.* had been expended in labour and 1450*l.* in merchants' bills, making a total expenditure of 5502*l.* The receipts had been for copper ore 1818*l.*; for tin, 4587*l.*; for wolfram, 230*l.*; and the sale of tungstate of soda, arsenic, and tungstate acid had made the total receipts 6883*l.*, leaving a profit of 1380*l.* To this was added 846*l.*, balance brought forward from the last meeting, and out of this it was proposed to pay the adventurers a dividend of 2s. 6d. per share, amounting to 800*l.*, and which would leave a balance to the mine of 1427*l.*, 1400*l.* of which was to be applied to the payment of the award for encroachment to the South Crofty Mine. Capts. W. S. Garby (manager), John Maynard, and John Hosking, in concluding their report, stated that there were two stopes in the bottom of the 130 of the south lode—one east of the cross-course, worth 25*l.* per fathoin, and the other west, worth 22*l.* per fathom. "There will be a stall required immediately in this stope, which we are now preparing for, and until completed it will necessarily somewhat diminish out returns of copper."

In answer to an enquiry by Mr. Wilkinson, the CHAIRMAN stated that the suspense account remained the same as at the last meeting. He proceeded to state that a resolution was passed at the last meeting by which it was proposed to meet the claim of South Crofty by a reduction of half the usual dividend until it was discharged. The reduction in the price of tin, and the high price of wages and of coal, had, however, prevented that, and 700*l.* still remained due. The whole of the South Crofty claim had been paid by the banker to the East Pool Mine, and, therefore, the remaining 700*l.* was due to him. The mine, however, had about 2200*l.* in its favour at the bank. He proposed, and Capt. T. Andrews seconded, the reception of the report and accounts. This was carried, and the dividend of 2s. 6d. agreed to.—In answer to enquiries, Capt. GARBY stated that the price of tin and iron had fallen a little, and the prospects of the mine were as good as they were at the last account-day.—Mr. MARTIN stated that in future the sale of wolfram would probably make a good item on the credit side, for they had introduced it into the market by quoting it at a low figure. ——

FLINTSHIRE LEAD MINING COMPANY.

The statutory meeting was held at the company's registered office in Liverpool, on Monday last (Mr. W. NOBLE in the chair). The CHAIRMAN said he had great pleasure in announcing that the directors had allotted 3000 shares, of which the vendors had taken 1250, leaving applications from investors to the extent of 17,500*l.* He had hoped that the entire capital would have been subscribed, as arrangements were made with an eminent firm in Halifax to place the balance. These gentlemen, however, had failed to place any shares; but, after consideration, he was convinced that for the future prospects of the company this was a fortunate circumstance. He had carefully considered the various plans proposed for unwatering the mine, and was certain that, instead of 15,000*l.*, as originally estimated, the work could be done for half that sum, and he purposed submitting to the directors a plan of utilising the present plant that would, in his opinion, most certainly effect this. Now, this being the case, the capital subscribed was ample to demonstrate the value of the mine, and having done this, the remaining capital would no doubt, if required, be readily subscribed *pro rata* by the existing shareholders, and the company, therefore, be established without incurring a shilling of expense for brokers' commission. He was glad to announce that the vendors were so satisfied with the manner in which the capital had been subscribed that they had agreed, in addition to the 12,500*l.* taken by them, to leave the directors the option for 12 months of tendering them shares in lieu of cash for the balance of the purchase-money. Arrangements had been made for immediately commencing operations, and he trusted that when next he met them he would have to congratulate them as the possessors of one of the finest mineral properties in North Wales. After some remarks from Capt. J. NANCARROW, it was moved by Mr. J. HOLT, of Halifax, and unanimously carried:—"That this meeting approve of the acts of the directors, and request them to proceed with the business of the company as proposed, and as they may think fit."

FLORIDA.—At an extraordinary general meeting on Wednesday, Mr. Lindow in the chair, a resolution was passed authorising the directors to call a special meeting for the disposal of the mine and the liquidation of the company.

VIRTUOUS LADY.—A meeting of shareholders was held on Wednesday at the Bedford Hotel, Tavistock (Capt. Engledue, R.E., in the chair), when it was unanmously resolved to wind-up the company voluntarily. Messrs. W. Jones, T. W. Greenfield, and T. Horswill were appointed liquidators.

FRONVELLAN (Lead).—At a meeting of shareholders, held at Winchester House, Old Broad-street, on Thursday (Mr. C. O. Rogers in the chair), the resolution passed at the meeting held on Oct. 31, to increase the capital of the company from 4000*l.* to 8000*l.*, was unanimously confirmed. The Chairman stated that since the meeting held on Oct. 31 the lode in the bottom of the mine had very much improved; it was at that time 1 to 2 feet wide, it was now 2 to 3 feet wide, with a solid branch of lead and blende 4 in. wide, and that everything seemed to indicate that they were nearing a large deposit of ore. Out of 4000 shares offered to the shareholders over 3000 had already been applied for.

SPANISH ZINC COMPANY.—The first general meeting of shareholders under the Companies Act, 1867, was held at the offices of the company, Duke-street, Liverpool, on Nov. 4. The secretary having read the notice convening the meeting, and Mr. Turner (a director) having taken the chair, it was resolved unanimously that Mr. Masser and Mr. Wilkinson, two of the directors retiring in pursuance of Article 58 of the Articles of Association of the company, but being eligible for re-election, be and were thereby, re-elected directors. The Chairman stated that the present meeting being merely a formal one, held in pursuance of the Act, there were no accounts to lay before them. Their engineer reported that the progress at the mines was satisfactory, and an extensive supply of the newest dressing machinery will be sent out. A vote of thanks to the Chairman having been passed, the meeting separated.

FLORENCE (Tin).—At the meeting, on Nov. 6 (Mr. J. Markill in the chair), Captain W. A. Wallinger reported that since July 23 there had been removed 193 fms. 2 ft. of ground. In the monthly return of tin the improvement, though gradual, is steady. During August the return was 2 tons 19 cwts.; during September 4 tons 5 cwts; for the month of October they will sell about 5 tons 4 cwts. The sale will take place on Thursday next. While it is a matter for congratulation that the lodes in this level are fast improving in size and value, it must be borne in mind that no great increase in the returns of tin can be made until these levels shall be opened out for work. He thinks that the mine bids fair to be most valuable. The reports, &c., were received, and the directors and auditors appointed.

[For remainder of Meetings see to-day's Journal.]

UTILISATION OF TIN SCRAPS.—A corporation known as the Manhattan Metal and Chemical Company has recently been formed in New York for the working of a chemical process for the recovery of valuable material from tin clippings. The process, which has been lately patented, is as follows:—The tin scraps are first treated with hydrochloric acid of 20° Baumé, until the bath is exhausted; 2 or 3 per cent. of nitric acid and about 1½ per cent. (of the amount of hydrochloric acid) of chlorate of potash is then added, which in a measure regenerates the bath, so that 500 lbs. of hydrochloric acid is found sufficient to treat 1 ton of scraps. About 1200 lbs. of clippings are placed in a drum, which revolves successively in several vats or tanks charged with the liquors used in the process, being transported from one to the other on an elevated tramway. The first vat contains hydrochloric acid. The tin being dissolved, the drum is inserted in the second vat, which is filled with water, and then allowed to rotate for a few minutes. A second washing in water follows in order that the iron scraps may be completely freed from acid, and finally the drum is plunged in a weak solution of silicate of soda, which forms a coating over the scrap iron and prevents its rusting. The time required to treat one charge averages about 1 hour 15 minutes. The tin is precipitased by spelter in a metallic form ready for melting, while there remains in solution chloride of zinc and chloride of iron, which are valuable for the preparation of paint, as disinfectants, or for the preservation of timber.—*Scientific American.*

The aeronauts, Mr. Glaisher and his companion Mr. Coxwell, reached an altitude of 37,000 feet, or seven miles from the earth, where they found a temperature of 50° Fah. below freezing.

FOREIGN MINING AND METALLURGY.

The visible supply of Banca tin in Holland at the close of October was estimated at 114,637 ingots, as compared with 125,359 ingots at the close of October, 1871. The visible supply of Billiton tin in Holland at the close of October was 23,800 ingots, as compared with 14,090 ingots at the close of October, 1871. The deliveries of Banca in October were 15,400 ingots, as compared with 27,800 ingots in October, 1871; and in the ten months ending Oct. 31 this year 89,767 ingots, as compared with 143,901 ingots at the close of October, 1871. Prices fluctuated a good deal during October; the close of the month left Banca at 96½ fl., and Billiton at 87½ fl. The relatively low price of this latter description of tin has been occasioned by a certain glut in the arrivals; it is probable, however, that existing supplies will soon be disposed of, and that prices will consequently speedily revive. At Paris, Banca tin, delivered at Havre or Paris, has made 156*l.*; Straits, delivered at Havre or Paris, 156*l.*; and English, delivered at Havre or Rouen, 154*l.* per ton. At Paris, Chilian copper in bars, delivered at Havre, has made 87*l.*; ditto, in bars at Paris, 87*l.*; ditto, in ingots, 93*l.*; English tough cake, 91*l.*; and Corocoro mineral (pure copper), 87*l.* per ton. At Marseilles, Toka copper for consumption has realised 76*l.* per ton. At Rotterdam, Drontheim has been quoted at 50 fl. to 52 fl.; and Russian crown at 51 fl. Rough French lead, delivered at Paris, has brought 21*l.* 12s, per ton in that capital; ditto Spanish, delivered at Havre, 21*l.* 8s.; ditto English, delivered at Havre, 21*l.* 4s.; and Belgian and German, delivered at Paris, 21*l.* 12s. per ton. At Rotterdam, Stolberg has realised 12⅜ fl.; Spanish, 12½ fl.; and German of various marks, 12¼ fl. At Paris, Silesian zinc, delivered at Havre, has made 24*l.* 12s.; ditto, other good marks, delivered at Havre, 24*l.* 8s.; and ditto, delivered at Paris, 24*l.* 16s. per ton. At Amsterdam, Silesian zinc has been quoted at 13 fl. to 13¼ fl.

A downward tendency is becoming more and more observable in the French coal trade, although at present prices have not varied very materially. A greater readiness is remarked to effect sales, and this is taken as an indication of an absence of confidence on the part of the trade in the maintenance of present prices. Deliveries of coal are being made pretty well in France, upon the whole; in the Pas-de-Calais the colliery proprietors have at their disposal as many trucks as they can desire, and the yards of the La Chapelle station are sufficiently supplied. This is unfortunately not the case with the depôts in the environs of Paris, which are in a much less satisfactory position; this arises, perhaps, from the habit which many Parisian suburban coal merchants have of only dealing as regards their supply with one single company, which during some strike or trade crisis possibly may be unable to keep its engagements. Everything, however, points to the conclusion that the French coal crisis is coming to an end. The sugar works have laid in all their supplies in advance, and will not require much more until February. Small industrials, who had suffered a good deal in the distribution of an insufficient stock, begin to be more regularly served. The production is regaining vigour on all sides: the cold weather has come on slowly, and everything is tending rapidly to the normal state of affairs. Opinion is still, however, a good deal divided as to the probable extent of the fall which may possibly take place in prices. The Northern of France Railway Company is stated to have let contracts in Belgium at 1*l.* 0s. 10d. per ton. In consequence of heavy rains some trouble is apprehended with the navigations.

Transactions in coal have been very active in Belgium, all qualities being in good request; prices are maintained pretty well for the present, but display a tendency to give way rather than otherwise. Trucks are scarce, and make default altogether in many localities; the Northern of France is stated, however, to have taken energetic measures to dispel all apprehensions on the subject, especially in the basin of the Pas-de-Calais; but it can scarcely be said at present that the state of affairs has materially improved in Belgium. At the same time, the apprehensions felt in regard to the matter appear to have somewhat subsided, and supplies for domestic purposes have been kept up tolerably regularly. Coke is scarcer than before, and prices have attained an extraordinary point. Orders for coal are being given out in Belgium for 1873. The production of coal is sensibly increasing in Belgium with the return of workmen to the mines; the additional production still fails, however, to fully keep pace with the requirements of the sugar manufactories. Freights for Paris remain without material change. It is stated that several industrials of Bois-le-Duc, Helimond, and other towns in Northern Brabant, in view of the greatly increased price of coal, have altered the furnaces of their steam-engine boilers, so that they may use Dutch and other turf. The experiment is, of course, being watched with much interest. The high price of coal is telling adversely upon the production of glass, which is being curtailed in consequence. The La Haye Collieries Company will pay Dec. 2, a second dividend of 10s. per share in respect of the exercise 1871-2.

The advancing tendency which for several months past has been noticed in the Belgian iron trade appears to be checked; this is the most clearly established fact of the last few days. Prices are still maintained, but less firmly than before, and a certain number of transactions have been concluded below the generally quoted rates. Refining pig is maintained between 5*l.* 12s. and 6*l.* per ton, but it is the last effort, as similar English pig can be obtained between 5*l.* 4s. and 5*l.* 12s. per ton, duty paid. The fall which is taking place in prices in England will no doubt accelerate the downward movement in Belgium. Already the intelligence that rails can be obtained in England between 11*l.* 4s. and 11*l.* 12s. per ton, while in Belgium similar rails have attained, and even exceeded, a quotation of 13*l.* 4s. per ton, has caused Belgian quotations to decline rapidly, and business would now be done readily at 12*l.* per ton with deliveries in the course of 1873. This is the rate at which a contract was secured last week by the Monceau-sur-Sambre Company, and somewhat similar terms will probably be witnessed at an adjudication which is to take place on the 20th inst. in connection with the Belgian State Railways. Old rails do not display any very great downward tendency at present, being held firmly at between 7*l.* 12s. and 8*l.* per ton—a rate which they have only exceeded accidentally and under exceptional circumstances. The fall in this article, we believe, will be less decided than in others. Plates are worth 17*l.* 4s. and even 18*l.* per ton. It is stated that the Couillet Works have concluded contracts at these prices for large quantities intended to be forwarded to Germany. The quotation is, however, an exaggerated one, and one which will be no longer attained. As English plates can be obtained duty free at between 16*l.* and 16*l.* 16s. per ton. Great activity continues to prevail in connection with railway plant. Industrials will not, however, suffer much from the present downward tendency in prices, since, if we may believe the statements which have appeared upon the subject, they have their production assured for at least half 1873. At the same time, the managers and proprietors of works now exhibit a certain eagerness to secure fresh orders. The Belgian Company for the Construction of Engines and Railway Plant has been paying this month a dividend for 1871-2 at the rate of 1*l.* 12s. per share.

The demand for iron continues good in France, and orders on foreign account succeed each other rapidly. German orders especially support the French iron markets. Charcoal-made refining pig is selling at 7*l.* 16s. per ton, and even more, in the Haute-Marne. Rolled coke-made iron has brought 14*l.* per ton, while rolled charcoal-made has realised 18*l.* 16s. per ton. The Paris iron market presents much the same aspect. Merchants' iron has brought 14*l.*, and plates 19*l.* 4s. per ton. For pipes required for water-supply purposes the municipal authorities of Lille have just concluded contracts with MM. Deplechin and Mathelin, at 12*l.* 4s. per ton. MM. Ferdinand de la Rochette, manager of the Givors Blast Furnaces and Foundries Company; Harel, manager of the Pont l'Eveque and Givors Blast Furnaces and Forges Company; and Chalontre, director of the Franche-Comte Forges Company, acting as representative of the companies to which they are attached, have solicited a concession of ironstone mines on the territory of the Commune of Arvilland, in the arrondissement of Chambéry (Savoy). The concession comprises a superficial area of 180 acres. The Traes-Lille Company is paying a dividend for 1871-2 at the rate of 3s. 8d. per share, only partly payable, however, in cash. The Mokta-el-Haded Magnetic Iron Minerals Company is also paying a dividend of 9s. 6d. per share.

THE FLAGSTAFF MINE.

It cannot fail to be highly satisfactory to the shareholders in this mine to receive such valuable testimony of its progressive value as that adduced by Mr. Frames, the director who has just returned from Utah. The visit was undertaken at the instance of his colleagues, who with himself had become convinced that it was very desirable a member of the board should from time to time personally examine the condition and management of the property, the more especially as the superintendent, Mr. Maxwell, had expressed an opinion to a similar effect.

The Flagstaff Mine is situated at the head of Little Cottonwood Canon, the road ascends 4000 feet from the entrance of the canon, where the Flagstaff furnaces are located. The ore-house is about 400 feet above Alta City, and receives the ore by tramway from the present tunnel entrance, about 1000 feet above it. The vein of ore, enclosed by its walls of rock, is sharply marked to the most unpractised observer, and from actual measurements of the ore in sight at the three lower levels, taken at the request and in the presence of Mr. Frames, there are 192,540 feet, averaging the width of the lode at 3 feet. The ore in weight is estimated at 3 in. to the fathom, or 9 cubic feet to the ton—which would show 92,540·9 or 21,383 tons—and on the same data, for the two upper levels of the old workings, where there are large quantities of good ore in sight, it does not seem excessive to regard them as making up the total to 30,000 tons.

The ore falls from the stopes above the present tunnel, and is lifted by a mule from below it into cars that convey it on a tramway to the tunnel mouth, where it is sacked and sent down the incline to the ore-house. At these two points there were about 600 tons ore, besides 400 tons at the furnaces. It is intended to have a stock of 6000 tons at the ore-house before winter sets in, to provide for work being interrupted on the incline by snow. About 600 feet below the present tunnel a new one (called the "Maxwell") has been started, and will be carried through the mountain into the adjoining canon of Big Cottonwood, where there will be an eligible points of egress. If the lode continues in its present direction the tunnel is expected to strike it at 800 or 900 feet from its mouth, at a depth of about 450 feet from its intersection with the tunnel above. The prosecution of this important work will take some time—probably 18 months—before meeting the lode, but success in its aim—or in making other discoveries on the way—would establish a multiplied value of the property.

The road in the canon had been put in tolerable order just before Mr. Frame's arrival. A subscription of 3000*l.* had been raised for road purposes from several of the larger interests, the Flagstaff contributing 300*l.* One-fourth had been paid and was in course of expenditure. The remainder is reserved for next spring. The transport service is under contract with responsible men, at $7·50 per ton in summer, and $8 in winter, to haul, as required, 50 tons per day to June 1, 1873, from the mine to the furnaces. No difficulty is feared by the contractors or by Mr. Maxwell from the winter, as the sledge will be substituted for the wagon over the snow, and interruption is only looked for in May and June, when the snow melts. In the neighbouring canon of American Fork a line of rails has been laid down, and it is probable that before long engineers will be able to face the difficulties of Little Cottonwood. The daily freight of ore down the canon is so great as to compel some solution. On the transport of 50 tons per day, that may be expected, at a tramroad rate of 10s. per ton for the 10 miles, there would be a saving to this company of 15,000*l.* per annum.

The mine is capable of sending down 50 tons of ore per day at a slight increase of cost, but the two furnaces up to the date of Mr. Frames arrival had only consumed 20 tons of ore per day. Later returns show an increase, but the proper co-operation of the mine and furnaces must wait for the third furnace—hot cylinder blast—the machinery of which has since arrived from Pittsburg. It is expected to double the production of bullion, or to turn out reliably 18 to 20 tons per day in all, and also to treat low grade ores of 20 per cent. profitably. For the three months, ending Sept. 15, 1467 tons ore produced 619 tons bullion, or 2⅜ to 1, but during my stay I understood that poorer ores from the older workings were being sent down from the mine, and the returns for the next five weeks, ending Oct. 13, show 1167 tons of ore to produce 326 tons bullion, or 3½ to 1. These differing results suggest also an imperfect action of the furnaces, which the new furnace may be expected to remedy. Former difficulties in the supply of charcoal appear to have ceased. A good contract exists for 1500 bushels per day, or more at option, at 30½ cents per bushel, deliverable at the furnaces, quality to be approved on arrival; purchases made of other burners at 24 to 26 cents, on the same terms, reduce the average cost to about 29 cents. Stock on hand 65,000 bushels, and the contractor states his reserve at a railway station in the Territory to be 100,000 bushels, besides the same quantity in preparation; altogether an ample provision for the winter. It is expected that coke will be economically used instead of charcoal for the new furnace.

The smelting works, the houses of Mr. Maxwell and the chief smelter, the boarding house for the men, and the office are located on a tract of ground of about 16 acres belonging to the company. The water power for the smelting works is supplied by a leading from the stream that runs down the canon, that is ample and constant.

The distance of seven miles from the railway station of Sandy is an element in the cost of the bullion before it reaches a market, and of charcoal and other supplies for the works. It is hoped that before long this charge will be reduced to a railway rate. The granite for the Mormon Temple, building at Salt Lake City, is all obtained at the entrance of Little Cottonwood; and a railroad is being made to carry the granite blocks to Sandy; a branch of a few hundred yards will connect it with the smelting works, and on the larger transport required for three furnaces, will lead to a saving of 4000*l.* to 5000*l.* per annum.

The importance of the Utah mines has brought competing buyers of the bullion to Salt Lake City, and, as the result of higher prices for sales on the spot, 250 tons were sold at $300 per ton to the same company, through whose agency all former productions realised only $250. The difference amounts to 25 per cent. on the net income of the company. Refining works are now being erected in Salt Lake district, that must improve and steady the bullion market. There are signs also that smelting will be carried on as an independent employment, and establish a fair market for ores.

COLORADO.—The works of the Swansea Smelting Company, near Georgetown, under the superintendence of Mr. Richard Pearce, for many years in charge of the silver smelting department of Messrs. Williams, Foster, and Co., of Swansea, Wales, are successfully treating the rich smelting ores of that section. Mr. Pearce has also discovered a vein of pitch blende, containing uranium. He has leased the mine, and will ship the ore to England. The Whale Mining and Smelting Company, also an English organisation, have completed one of their furnaces, and are now meeting with success in the treatment of their ore. They are also ore purchasers. Collom's dressing works, near Idaho, are rapidly approaching completion. In the Coldstream lode, at Georgetown, they have a vein of solid mineral rich in silver, 3¼ ft. in width. The ore blockade still continues, notwithstanding the fact that several purchasers of ore are in the market. It is confidently hoped, however, that the completion of the railroad, and the erection of new metallurgical works, by an English company, at Golden City, will bring relief.

The following is from the New York Wall-street Journal's Utah correspondent, dated Salt Lake City, Oct. 24th:—

Many new enterprises have been inaugurated here, which show the confidence of capitalists in the permanency of our mines. A narrow-gauge railroad has been already completed, and is in good working order up the American Fork Canon. The success which has attended this road has induced the construction of others. One has already been projected to connect Bingham Canon with some point on the Utah Southern Railroad. The surveys are now being made, and immediately they are finished the grading will be commenced, and the construction of the road pushed forward with all possible dispatch. The matter is in the hands of several of our most influential and wealthy citizens, whose names are a sure guarantee that the road will be built. This road is calculated to open up a cheap way to market for the immense deposits of ore in that canon, which, being of a comparatively low grade, will yield a much larger profit under railway transportation than by the old method of mule teams. The mines in this camp are looking quite well, and much labour and money are being spent in their development.

The Emma Mine continues to produce large quantities of ore, selling daily in this city about 100 tons, averaging 67 ozs. silver and 48 per cent. of lead. The great suit between this company and the Illinois Tunnel Company is to come off soon in the Third District Court in this city—the clans are already marshalled and arrayed for the fray. The importance of this suit cannot be over-estimated. The question to be decided is whether or not a United States patent gives the right to follow and work the lead in its full length when it extends outside the lateral side of the surface covered by the patent. If decided in the affirmative, then may we go on our way rejoicing; if in the negative, then it will become necessary for the owners of mines to develope them for the whole length of their claim, in order to show the course of the vein the whole distance, before it would be of any use to acquire a title from the United States.

A company has been incorporated in San Francisco for the purpose of building a wire tramway from the mines to the mouth of Little Cottonwood Canon. It is proposed to build it above the snow-line, so that it can run uninterruptedly during the winter months. The contracts for the timber necessary to build it have already been let, and work upon it will be vigorously pushed. Some such means of transporting the ore down the canon has become a necessity on account of the quantity produced and the great cost of transportation by teams.

The Mammoth Copperopolis is now producing large quantities of gold and silver ores, averaging sixty dollars per ton. The production of copper ores from the same mine, both in its quality and quantity, is also rapidly increasing, being at present from 250 to 300 tons per month of first-class ore. I understand that the company proposes erecting a mill for the reduction of their gold and silver ores. They have now upon the dumps, at the mine, some 700 tons of gold ore awaiting reduction.

The mines generally are developing beyond the most sanguine expectations of their owners. The possibility of a doubt as to their richness and permanency is entirely precluded by the developments already made, and that the mineral productions of this country in future will be immense is now a well-established fact.

In confirmation of the above, relating to the narrow-gauge railroad to Bingham Canon, we clip the following from the Salt Lake Herald of Oct. 26th:—"Four miles more of grading on this line has been let, and it is expected that the grading will be done and the ties laid, for the full distance of seventeen miles, in sixty-five days. The road will run to the town of Bingham; perhaps even further up the canon."

COMPRESSED AIR MACHINERY IN MINES.—At the Delamater Ironworks may be seen a number of interesting pieces of mining machinery in course of construction; including air compressors for mining drills and other apparatus in mines of the Oronoco river district. Five similar engines have been lately built at this establishment, one of them for the Calumet and Hecla Copper Mining Company, of Lake Superior. These compressors are so constructed that fore and aft of the horizontally moving piston a sufficient body of water is maintained to fill all the passages leading from the cylinder at the end of each stroke. By this means no air is left in the cylinder, or its ports to expand again during the reverse movement of the piston. The water also serves to absorb the heat evolved by the compression of the air, and which, without some means of removal, would heat the machinery, and impair, if not destroy, its efficient operation. This matter of air compressing promises to be one of very great importance, for some of the best mines in this, as in other, countries are becoming so deep that the temperature is intolerable, and the exhaust from an engine worked by compressed air, from the heat rendered latent by the expansion of the exhaust air, will materially remedy the difficulty.—*Iron Age* (U.S.)

FOREIGN MINES.

FORTUNA.—The directors have declared an interim dividend of 5s. per share, payable on Dec. 28.

DON PEDRO NORTH DEL REY.—Telegram from Lisbon: Remittance, 8698 oits.; produce for September, 4239 oits.; weighed to Oct. 18, 871 oits.

EMMA.—Telegram: "Gained verdict; $5000 damages, and ore in dispute. Bought Illinois tunnel; valuable for immediate extraction of ore. Injunction perpetual; prevents appeal and costly litigation with Emma Consolidated of San Francisco. Emma railway up; canon arranged for."—Second Telegram: "Raised 250 tons first-class ore this week; putting in engine interrupted work; raised no second-class ore this week; 400 tons of first-class ore at railway depôt; 230 tons first-class raised ore at mine; 220 tons sold here. Anderson started New York yesterday."—Telegram, dated Salt Lake City, Nov. 12: "Rumour you mention refers to body in deepest workings, which is opening out splendid. Vein large and very rich. Will increase raising quality and quantity soon."

HUDSON (Gold).—Telegram from the manager, Mr. S. O. Brown:—"Hoisting works started finally on 8th inst. Everything working finely."

EXCHEQUER (Gold and Silver).—L. Chalmers, Oct. 14: I wrote you last 23d ult., since which our progress in the tunnel has been slow, owing to the hardness of the rock, only 28 ft. having been accomplished in three weeks. I am happy, however, to say that the face of the drift is now not quite so hard; this leaves 196 ft. yet to reach your Acacia ground. The mill machinery has arrived so slowly that I was obliged to put nearly all hands for 12 days on the I X L hoisting works, which I framed at the mill. All the machinery for the mill is now on the ground, but I shall send the carpenters to the I X L next week, as all my outside work here is almost finished. I delay giving you a full description of the mill till quite finished, but I am sure you will have a first-class mill at a low figure. My arrangements for supplying it with ore will also, I am sure, be satisfactory to the board. I have re-surveyed our timber ranche at the mine, and done some fencing here to prevent trespass. There are five drinking saloons on Silver Mountain since my return, and there are only the I X L and the Exchequer Mines at work. When I write to you next you will be the owners of very valuable additions to your mining setts.

I. X. L.—L. Chalmers, Oct. 14: I have to report for the information of the board that after clearing out the Old Buckeye tunnel I found two things which gave me great satisfaction—1. That the I. X. L. lode proper and the Buckeye lode cross each other where shown on my survey.—2. A shaft as large as I intended sinking higher up, though filled with water, 85 ft. deep, and well timbered, as far as I can at present ascertain. Here I determined to sink, and as a preliminary thereto raised 30 ft. to the surface from the tunnel level, and have all but completed a very heavy piece of cribbing (rendered necessary by the formation of the side hill) as a foundation for the hoisting machinery, as well as the excavation, partly in rock of a substantial base for the hoisting-house and carpenters' shop. I have also had framed here the whole building, and the last piece of it went to the mine on Saturday. To-day the boiler for the engine left for its destination, and in course of this week the engine and other machinery now here will be on the ground. So soon as the grading is completed I shall send six carpenters from the mill to raise and put the building together. The machinery took just five weeks to reach Reno, and I had to go there myself to learn anything about its whereabouts. Luckily it reached Reno the day before I got there; I saw it sent off to Carson, and had teams to bring it up to the mill. I need scarcely point out to you the immense saving effected by using the Old Buckeye shaft in expense and time. I shall be guided by the appearance of the shaft at the bottom, when I get the water out of it, how far I shall continue the sinking before driving, my object being to get out ore for you as soon as I possibly can, and that I venture to predict will not be long. I have located a timber ranche for our fuel supply, which will cost you nothing but the deeds and recording.

ALMADA AND TIRITO.—Telegram from Mr. Clemes: "September profit for month, $9242; equal to 1848*l.* 8s. sterling; profit after deducting London expenses, 1722*l.* 8s."

CHONTALES.—The directors have advices from Mr. Smeddle, dated Oct. 5: Gold returned for the month of September, 354 ozs., from 1764 tons of ore; average yield, 4 dwts. per ton; value, 993*l.* Cost for the month, 1075*l.*, which includes 317*l.* for freight of rails and machinery, and other extraneous charges. Mr. Smeddle, having arrived on the mines only on Sept. 21, did not feel himself sufficiently conversant with the property to state what he considers most advisable, but will do so by next mail. He, however, states—I am fully impressed with the necessity of further operations for the development of the property. It is the general opinion here that the lodes become poorer as they get deeper; of this I am by no means certain, and intend this ensuing month to try No. 3 level, at Santo Domingo. But even allowing it to be so, should we meet with such lodes as have already been worked (which there is every reason to expect), with the present battery of 36 heads (presuming the additional 12 now on the ground to be erected), and reduced expenditure, I have no doubt of the mines paying. Health of establishment good.

— J. Tonkin, D. Tonkin, Oct. 3: Herewith we beg to hand you our report of these mines for September:—East San Benito Mine: A stope in the back of No. 2 level, west of cross-cut, has been stoped 82 varas; lode 4 ft. wide, worth 6 dwts. of gold per ton. A stope in back of No. 1 level, east of cross-cut, has been stoped 54 varas; lode 3 ft. wide, worth 3 dwts. of gold per ton. The No. 2 level has been driven east on the course of the lode 10¼ varas; lode 6 ft. wide, worth 2 dwts. of gold per ton.—Santo Domingo Mine: The intermediate level has been driven west on the course of the lode 10 varas; lode at present 3 ft. wide, worth 2 dwts. of gold per ton. The same level has been driven east on the course of the lode 7 varas; lode 6 ft. wide, worth 2 dwts. of gold per ton. A stope in the back of the intermediate level has been stoped 117 varas; lode 5 ft. wide, worth 4 dwts. of gold per ton in the western part, and 2 dwts. in the eastern part. A stope from the surface, on the south part of the lode, has been stoped 30 varas; lode 5 ft. wide, worth 10 dwts. of gold per ton. We have not been able to do much towards the San Sebastian tramway, in consequence of the scarcity of native labour, the whole of our force being necessary to supply quartz for the 24 heads stamps which are at the present time at work. Wages at present are very high; we have had letters from Cornish miners in New York offering to pay their passage to Greytown provided the company pay their expenses thence to the mines, and guarantee work on their arrival. We are pleased to inform you that the mines throughout are looking better. The quantity of quartz sent to the stamps is as follows:—From East San Benito Mine 648 tons, yielding 3½ dwts. of gold per ton; from Santo Domingo Mine 973 tons, yielding 4½ dwts. of gold per ton; from San Antonio old heap 107 tons, yielding 3 dwts. of gold per ton: in all, 1764 tons=354·500 ozs. of melted gold.

SAN PEDRO.—R. M. Kitto, Sept. 30: The following is my report of this and adjoinng mines:—New shaft is sunk 15·40 metres below the 135; sinking by eight men, at $40 per metre; ground favourable, and water very little; we are still making good progress here. A cross-cut at the 135, driving nearly due west to cut the western branches, we have cut several small branches, all containing very rich ores. A stope in the back of the 135 will produce 10 tons of 30 per cent. ore per fathom; this stope is communicated to the 128; the ore is left standing in the side of the level by former workers. A stope in the south part of Manto, in back of the 135, will produce 12 tons of 30 per cent. ore per fathom. The 128, driving west 45° north, will propuce 6 tons of 20 per cent. ore per fathom, and still kindly for further improvement; this is on the change from black and grey ore to bronces, or yellow sulphurets. A chiflon sinking in the bottom of the 128, on the south part of Manto, to communicate with the stope in the back of the 135, will produce 4 tons of 30 per cent. ore per fathomr—North Part of Manto: The 122, driving north 45° east, will produce 1½ ton of 40 per cent. ore per fathom. A tribute pitch in the back of the 110, at one-quarter tribute, will produce 3 tons of 30 per cent. ore per fathom. Filling up and securing both the old and new works is being carried on with great success, both as regards economy in timber as well as saving of labour.—Santa Helena Mine: A chiflon sinking on the Manto course for roadway is improving in appearance, and is producing good stones of ore.—San Antonio Mine: New shaft sinking from surface, by two men; ground favourable. Cuba Mine is suspended for the present, on account of being short of workmen. In conclusion, I beg to state the San Pedro Mine is looking better than I ever saw it, and everything is in good working order.

NERBUDDA (Coal and Iron).—Under date Oct. 6 the agent writes that he is daily improving the quantity of coal; has commenced to reduce the water in the old engine incline, which, however, lowers slowly, in consequence of the heavy falls, of recent date, near the river: and that he has got into newly-found coal by drift, which proves very well.

LUSITANIAN.—T. Chegwin, Nov. 5: Palhal: We hope to resume the sinking of Taylor's engine-shaft below the 160 at the end of this week; the lode will yield 5 tons of ore per fathom. A communication has been effected between River shaft and the 130 fm. level on Basto's lode. In the 160, east of Taylor's, the lode is worth 2 tons per fathom, and in the same level west 4 tons. In the 160, going west, the lode is also yielding 4 tons per fathom, but the opposite end of the level is unproductive. The lode in the 140 east is 5 feet wide, composed of quartz, and in the 130, east of River shaft, 4 feet wide, of the same character. In the 130, east of River shaft, the lode is 6 feet wide, yielding stones of ore. In the 110 east the lode is 2 feet wide, composed of flookan and schist; the lode is 1½ ft. wide. The 90 east containing a little lead ore. The 80 east is 4 feet wide, spotted with ore. The 70 east is 2 feet wide, producing ½ ton per fathom. In the 38, west of slide lode, the branch is 6 in. wide, composed of quartz and mundic.—Mill Lode: In the 18, east of Taylor's, the lode is 8 in. wide, yielding ½ ton per fathom. We are continuing the 140 south-west, and the 130 south-west and north-east of Taylor's, on the slide lode, which varies from 1 to 1½ ft. wide, and is composed of flookan and schist. The adit cross-cut, south of branch, west of Perez' shaft, is still being driven in a hard gneiss. Winze No. 92 is being sunk below the 70, east of River shaft, on Basto's lode, which is 6 feet wide, spotted with lead.—Carvalhal: The 60 fm. level cross-cuts, north and south of Incline shaft, continues in hard ground, and progress is consequently rather slow.—Levels on Great Lode: In the 60, east of Incline shaft, the lode is 2½ feet wide, composed of quartz, and is more compact than it was. In the 50 east the lode is 1½ ft. wide, composed of quartz and country, and in the same level west it is of the same size, yielding stones of lead. The 40 is going east on a lode 2 feet wide, composed of quartz and a little mundic. In the 40 west the lode it rather disordered, being near the junction of the caunter lode. The 30 and 20 east are unproductive.—Caunter Lode: In the 10, west of Incline shaft, the lode is 3 feet wide, composed of quartz, mundic, and lead, yielding of the latter ½ ton per fathom. The lode in the 20 west is 1½ ft. wide, worth ½ ton per fathom. In the adit level, west of Incline shaft, the flookan lode is 2 feet wide, valueless.

BENSBERG (Lead Mining and Smelting).—J. W. Hoffman, Nov. 9: The large boiler is now finished, and has been tested to 120 lbs. pressure. We shall commence bricking it next week. The preparing of the timber for the roof of the dressing-floors will occupy us until the end of the month; when that is done, and the roof up, we can commence putting in the dressing machinery, which is ready. The new packing-rings were put into the pump last Friday, so that we shall resume sinking in the engine-shaft this week. There is very little alteration in the bed of ore this week; it is still very productive, but requires rather more carefully getting, as streaks of sand and clay appear in it. Our production for the past week would have been better but for a holiday on Monday, and wet weather on Tuesday, which prevented any out-door work. Weeks production this week 30 tons, average assay 45 per cent. Galena put aside for dressing 50 tons, assay 10 per cent. Ore delivered this week 70 tons.

[For remainder of Foreign Mines see to-day's Journal.]

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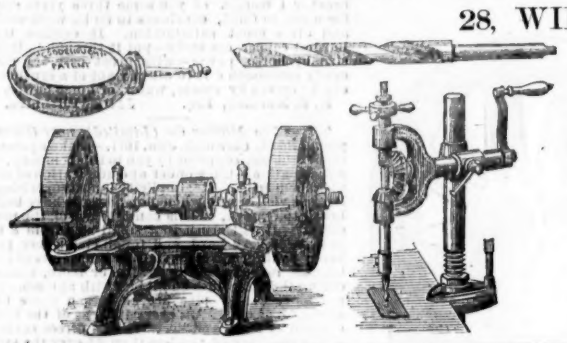

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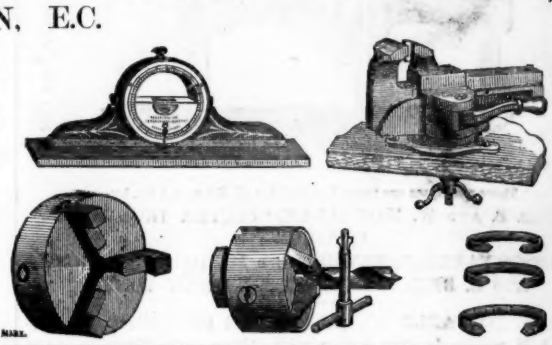

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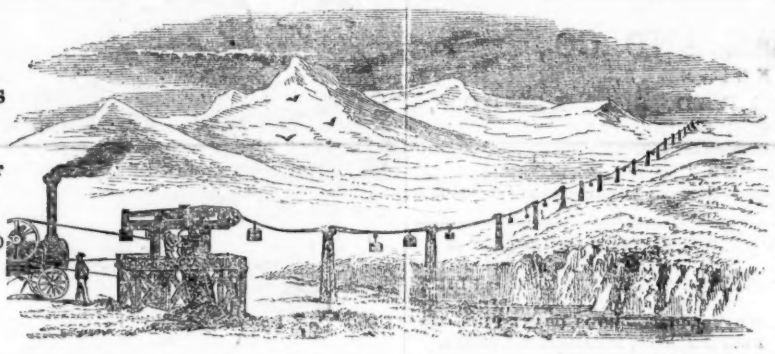

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